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### Scouring Castings of Iron.--Coating with Zinc.

All castings of iron are surrounded with a scale which must be removed if the articles are to be galvanized or scoured bright. The way to remove this scale is to steep the articles for about 6 hours in a liquor composed of one part of sulphuric acid to ten parts of water, then take them out and scour them in warm soft water with fine sand. Some use the acid solution much stronger than the one described; it removes the scale sooner, but is more disagreeable to use.

Articles to be galvanized after being scoured bright and washed in warm clean soft water are dried, and are then fit to be dipped into the galvanizing pot. This is an iron pot placed on a suitable furnace containing molten zinc; the surface of it is covered with ground white sand or glass. This is to prevent the zinc escaping in the state of gas, it being a volatile metal. A vessel containing a strong solution of salammoniac, or the chloride of zinc, is placed beside the zinc pot, and into this is dipped (for about a minute) each article, previous to immersing it in the molten zinc. The articles must be cautiously and carefully handled in the molten zinc, in which they are kept from three to five minutes. After they are taken out of the zinc they should be cooled slowly, then washed in soft water. It is very difficult to make zinc take on smoothly, especially on chains for pumps.

Wire is galvanized or coated with zinc in the manner described, only it is reeled off a winch through the ammonia, or chloride of zinc solution, then slowly through the molten zinc, from which it is wound on another reel. It does not make much matter if a superfluity of zinc is roughly taken upon the wire as it can be smoothed by running it through a draw plate; but chains cannot be so smoothed. Sheet iron is galvanized in the same manner, and as the sheets can be rolled after being galvanized, a little roughness of surface does no harm.

### Boring in Hard Rocks.

In a brief article by H. A. Hildreth, in the *Mining Magazine*, published in this city, the great difficulty of approaching the fortifications of Sevastopol by sap and mine is attributed to the hardness of the rocks in the neighborhood of that city. The rock is *basalt*, which is nearly as hard as *trap*, and much harder than granite. The cost of boring in trap rock for minerals is about twice as much as in granite, and three times more than in sandstone.

Trap is among our hardest rocks, and it is this that forms the Russ and the new small block pavements of this city. A stupendous dyke of this rock, eight miles wide, commences at the Highlands of the "Nevisink," and flanks the west shore of the Hudson river for fifty miles above Jersey City. This dyke contains as much paving material as would suffice to pave all the cities of the United States for half a century to come. It is a fortunate thing for New York that such excellent paving stones can be obtained in such abundance and so near at hand.

It is reported that the British Government has made large purchases of gutta percha knapsacks manufactured by the American Gutta Percha Company, this city.

## STRAINING SAWS BY ATMOSPHERIC PRESSURE.

Fig. 1

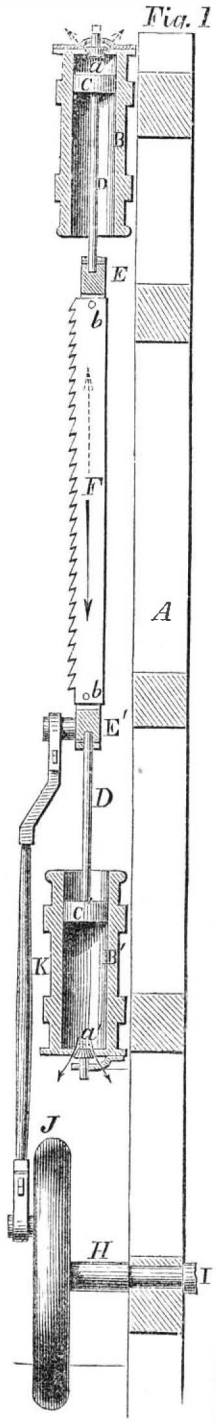
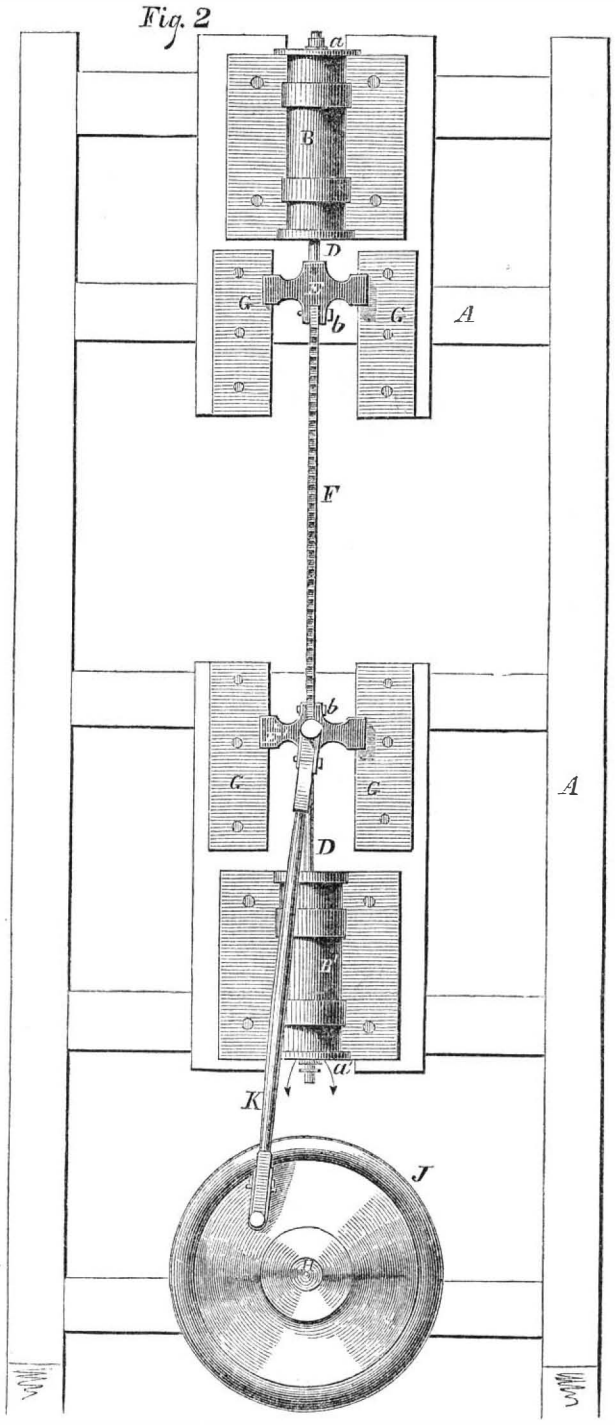



Fig. 2




On the 14th of August last, a patent was granted to A. Brown, and Abel Coffin, Jr., of Sabine City, Texas, for the excellent improved method of straining saws by atmospheric pressure, represented by the annexed figures—figure 1 being a transverse vertical section of the saw frame with the improvement attached, and fig. 2 a front view. Like letters on the figures indicate similar parts.

The improvement refers to that class of atmospheric straining of saws in which a cylinder is arranged at each end of the saw, with their inner ends open, and a piston in each, so actuated as to pull on the saw by simple atmospheric pressure, caused by the production of a vacuum between the pistons and the cylinder heads. The nature of this invention consists in the simple manner of producing this vacuum—atmospheric pressure having been applied to saws before, but not in the same way. The usual method of straining saws by atmospheric pressure by the use of two cylinders, is by connecting the closed parts of them by a pipe communicating with an air pump. The improvement represented simplifies such an arrangement; it obtains the necessary vacuum in the cylinders for straining the saw, and yet dispenses with the connecting pipe and the air pump usually employed. This is accomplished by providing each cylinder with a free snifting valve, by which the reciprocating action of the saw itself is made to produce the necessary vacuum in the cylinders behind the straining pistons. F represents the reciprocating saw attached at its ends by pins, *b*, to cross heads, E E'. H is the revolving driving shaft of the saw, to which it communicates reciprocating motion by means of a pitman, K, loosely attached to the lower cross head, E', of the saw, and operated by a wrist pin on a wheel, J, made fast to the revolving shaft, H. The saw is made to reciprocate in a true vertical course by guides, G G, along or up and down which the cross heads, E E', slide. These guides are firmly connected to the fixed framing, A, of the mill. B B' are the vacuum cylinders, provided with heads, or closed at their outer ends but open at their inner ends. In these cylinders the straining pistons, C C', are arranged and connected by rods, D, to the cross heads, E E', of the saw. They are made to pull on both ends of the saw by ordinary atmospheric pressure acting on the faces of the pistons exposed to the inner or open ends of the cylinders, and thus straining the saw, or keeping it straight and free from buckling, a vacuum being maintained between the pistons and closed ends or heads of the cylinder, by which means the simple atmospheric pressure is made available as a straining force, the pistons of course reciprocating with the saw, as in other arrangements of the kind.

*a a'* are puppet snifting valves, freely hung, and provided for the closed ends of the cylinders, B B'.

OPERATION—Previous to starting the saw to cut, or feeding the log, the saw receives a reciprocating motion—up and down—which suffices to expel any air from the inside of the cylinders through the snifting valves, *a a'*, as shown by the arrows, fig. 1. The sevalves, it will be observed, open outwards, and are fitted snug in their seats, so that when the air is expelled the pressure of the atmosphere on the outside closes them, and thereby a vacuum is always maintained in the cylinders. The pistons, C C', in the cylinders are therefore exposed to the pressure of the atmosphere on their two inner ends, acting in opposite directions to stretch the saw. With valves and pistons carefully fitted to work air tight, a vacuum will be constantly maintained in the cylinders, and no air will be required to be driven out at each stroke. But even with a small leak, sufficient air cannot get inside between the seat and valve, to vitiate the vacuum to such an extent as would injure the straining power of the full pressure of the atmosphere exerted on the outside of the pistons. When the saw is not cutting, it will be observed that, by reciprocating it once or twice after it has been standing still, it will not buckle, in driving out any air that may have found access to the cylinder. When the cylinders are once cleared of air, the snifting valves will remain fixed and stationary, and the pistons will then have the full pressure of the atmosphere (15 lbs. on the square inch) acting on them to keep the saw perfectly strained. The improvement is a beautiful and simple one; it does away with the branch connecting pipes and air pump, and does great credit to the inventors.

More information may be obtained respecting it by letter addressed to the patentees at Sabine City, Texas.

### A Man of Science Gone.

Professor Johnston, the author of "*Chemistry of Common Life*," and well known in the scientific world for his professional ability, died recently, in Durham, England, in his 59th year.

Three years since Prof. J. was in the United States, and delivered the Annual Address before the New York State Agricultural Society, at Syracuse. He was the author of a number of excellent works on Agricultural Chemistry, and was distinguished for his profound knowledge of agricultural science. He was highly respected in our country, both for his scientific acquirements and his manly virtues. All his works have been republished in this city; this shows the estimation in which he was held, and the practical character of his writings.

### Coal of Recent Formation.

At Haroe Island, the Kane Arctic Expedition found coal apparently of recent formation. The grain of the wood was still perceptible, but it was interspersed with small masses of a very pure resin. The supply was limited in depth only by the frost, and was so loose that it could be shoveled up without difficulty. It was found to burn well.

### Adulterated Food in England.

At the late meeting of the British Association, Dr. Pearson, in the chemical section, asserted that there were only two articles manufactured for food which were not adulterated, common salt and refined lump sugar. He challenged any gentleman present to add another article to the list.

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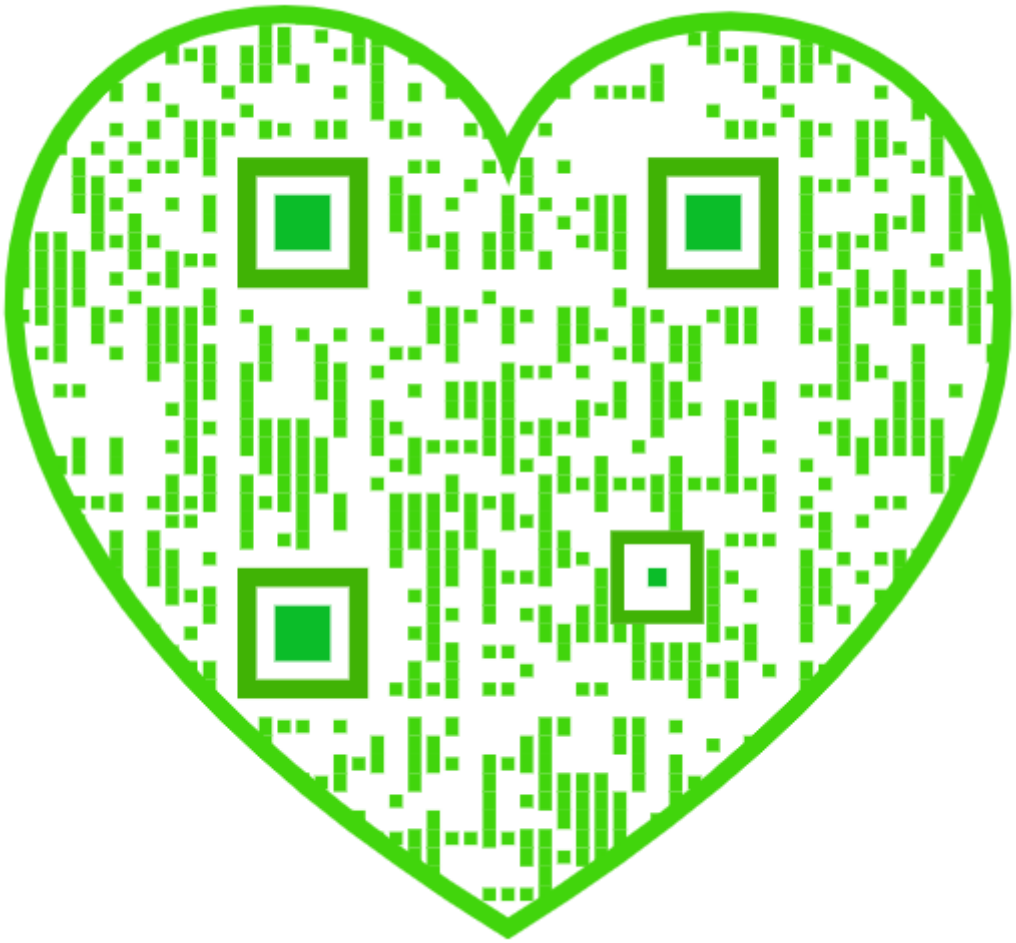

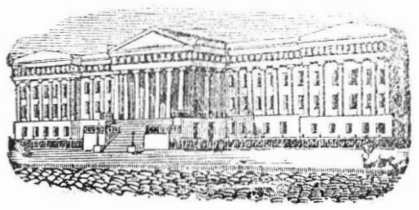

[Reported Officially for the Scientific American.]

## LIST OF PATENT CLAIMS

**Issued from the United States Patent Office**

**FOR THE WEEK ENDING OCT. 23, 1855.**

DOVE-TAILING MACHINE—John Bell, of Harlem, N. Y.: I claim the combination of the box, clamp, or frame, E, or its equivalent, for holding the pieces to be dove-tailed or tenoned, with the series of rotating cutters, substantially as described.

I also claim, in combination with the double inclined tables, the double set of rotating cutters, having the planes of the edges of the cutters working parallel with said tables, substantially in the manner and for the purpose set forth.

SCYTHE FASTENING.—Cyrus Clapp, of Montague Mass.: I claim the fastening of scythes to snaths, by means of the concave socket, d d, (fig. 4) and section of a ball, e e, (fig. 1) to which the scythe, g, is attached, and the center bolt, f, as described, the whole being arranged substantially as, and for the purposes specified.

FELTING HAT BODIES—Wm. W. Cumberland, of Newark, N. J.: I claim, first, the arrangement and combination in the manner substantially as set forth, of the hollow cone, F, and solid cone, G, placed within it; the larger ends of said cones being uppermost, having a wedging space between them of a proper size and angle, whereby the hat body, placed between them in the wedging space, will tend to tighten itself by its own weight, in the space, as it is rolled between the cones, as fully set forth.

Second, the combination and arrangement in the manner, substantially as described, of the reciprocating yielding roller frames, L L, with the table, B, one of them having such a motion, around the shaft, D, as to croze, or change the position of the hat body by the friction of the rollers upon the hat body upon one side, and the friction of the hat body on the table on the other side.

Third, the combination of the weights, K K, the roller frames, L L, levers, I I and J J, and the pivots, j j, attached to the cone, F, for the purpose of lifting the weight of the cone, F, and thus diminishing the friction of it upon the collar of the shaft, D, on which it rests below.

Fourth, I do not claim felting hat bodies by means of rubbing surfaces, carrying a roll between them; nor by means of an elastic cone carrying a roll.

But I claim as my invention partially felting hat bodies, enclosed, in their more tender state, in a hollow elastic cone of vulcanized india rubber, or other suitable material, lined with cloth, the larger and uppermost in which the hat body is placed in an open conical form, corresponding to that of the cone, by means of a process of bending or crimping, produced by the revolution of the elastic cone, between two surfaces, at a less distance from each other than the diameter of the cone, but not so near to each other as to cause the sides of the hat body within it to rub against each other, or the hat body, to form itself into a roll.

COAL LIFTERS—John B. Creemer, of Philadelphia, Pa. I claim the dish, H, and feet, J, in combination with the screen, operating as described, and for the purposes set forth.

GAS REGULATORS—Julius C. Dickey, of Saratoga Springs, N. Y.: I claim the valve chamber, B, cast in one piece with the perforated plate, I, in combination with the adjustment of the valve placed outside, as described, and for the purposes set forth.

DAGUERREOTYPE PLATE VISE—Samuel S. Day, of New York City: I claim the combination of the clamp, e, with the screw rod, c, bow, d, and cam piece, f, to hold the daguerreotype plate between and beneath the lips, 1, and 3 or 4, and g, in the manner and as specified.

FINISHING CARPETS—Samuel Fay, of Lowell, Mass.: I claim giving to woven figured fabrics, such as carpets, the finished appearance derived from the application of heavy pressure, whilst placing the goods in a roll, for convenience of transportation, and without distorting the pattern, by an irregular undue stretching of the fabric, substantially as described.

CARD PRINTING PRESS—Thomas Harsha, of West Union, O.: I claim attaching the box, S, which contains the form, to the lever, C, and connecting said lever with the ink rollers, c d, and feed rollers, M l, as shown, so that when the lever, C, is moved, and the form brought over the ink bed, J, the paper will be fed over the bed, Q, on which the paper is printed; and when the lever is moved over the bed, Q, in order to print the paper or cards, the charged ink rollers will pass over the ink bed, J, whereby the ink bed is kept properly charged with ink, and the paper fed over the bed on which the paper is printed, and the paper or cards printed by simply moving or operating the lever, C, as described.

I also claim passing the paper between two knives, T U, arranged substantially as shown, in relation with the lever, C, so that the printed paper or cards will be cut off in proper lengths as the form is pressed upon the paper, the knives cutting off a previous impression at each depression of the lever.

[The above invention is a printing press on a very small scale, intended for the aid of postmasters, merchants, and others, who have occasion to use business cards or stamps. By the peculiar arrangement of parts, the paper or cards are fed on to the type by the movement of the impression lever. The construction is quite simple and effective. Presses like these can be afforded at a very small cost. They will enable any person to become his own printer.]

MELODEONS—Geo. G. Hunt, of Walcottville, Conn.: I claim the described construction, whereby two, four, or more sets of reeds may be operated by one and the same valve, in the manner set forth.

SAFETY ATTACHMENT IN FRONT OF RAILROAD CARS—Charles Mahon, of Washington, D. C.: I am aware that rollers have been suggested or described as forming a part of a safety attachment to railroad carriages, in combination with a device, which may perhaps be considered by the office as an equivalent of the bar, and in manner somewhat similar to my method. I therefore disclaim such combination as referred to by the office.

But I claim the peculiar and novel combination and arrangement of the vertical and horizontal rollers with the bar, as described and represented.

SEED PLANTERS—Daniel B. Neal, of Mount Gilead, O.: I claim the arrangement of the shovel, c, the slotted and grooved slide, a, and gauge slide, b, when constructed and operated in the manner and for the purpose set forth.

SEALING PRESERVE CANS—Stimmel Lutz, of Philadelphia, Pa.: I do not claim broadly a self-sealing can, with a groove prepared with cement, nor do I claim a ground stopper and seat; nor a screw cap and mouth, made air-tight whether cement be used or not.

But I claim sealing a double sided can or jar at the outside, at or near the bottom, in the manner and for the purpose set forth.

PREPARING COTTON SEED FOR EXTRACTING OIL—Oscar Reisenbach, of Norriton Township, Pa.: I claim the application of sulphuric acid, or acids in general, to free cotton seed as it comes from the cotton gin, from all surrounding cotton fiber, previous to the extraction of oil from the seed.

MACHINE FOR SWEEPING GUTTERS, &c.—Robert A. Smith, of Philadelphia, Pa.: First, I claim an adjustable cutter brush, made to conform to, or correspond with the shape of the gutter to be swept, so constructed and arranged that it may be removed from and applied to the end of the shaft which carries it with facility, substantially as described.

Second, I claim the guard or gauge wheel, c, arranged so as to prevent the gutter brush from being carried too hard against or over the curb stones, so as to derange or injure it.

Third, I claim so arranging the gutter wheel by means of an angular axle, that the lowest portion of the tire, and the lower portion only, will come in contact with the curb stones, substantially as described.

MACHINE FOR COMPOSING AND SETTING TYPES—Wm. S. Loughborough, of Rochester, N. Y.: I claim, first, the presentation of the type cells in the machine, those of each case in the font, forming the arc or segment of a circle in the manner specified.

Second, the means above described, or their equivalents, which shall deliver the types from the various cells into the jaws of the transits, fixed to a wheel, or other rotary motion, for conveying the types from the slides, or their equivalents, to the galley or composing chamber.

Third, the combination of the lever, G, head, i, tappets, T, and springs, Y and S, with the line register, a, and its appurtenances; the lever O, rule or justifier, M, detent, g, and the index, N', and index plate, K', whereby the operator is enabled, simply by touching the keys, to do the entire business of composing types, and without a transfer of each line separately.

ELASTIC DIAPHRAGM STEAM PRESSURE REGULATOR—Joseph Woodruff, of Rahway, N. J.: I do not claim the convex or cup edged piston as it may have been used before.

But I claim the chains, H, as arranged in relation to the cupped edge or convex surface of the piston, for controlling and guiding the piston, and keeping it in its central position, without coming in contact with any substance to cause friction, when operated upon by the diaphragm, as set forth.

WHIFFLE TREES—Geo. H. Yard, of Trenton, N. J.: I claim the traversing slide, I, provided with a point fitted to the hole in the hook, G, in combination with a sliding pin, L, to fasten it, when the end of the slide is put into the hook to fasten the end of the trace on to the hook, substantially as described.

### The Patent Office once more—Defence of the Secretary of the Interior.

MESSRS. EDITORS—Under the head of "Encroachments on the Patent Office," its best friend, the Secretary of the Interior, is, to say the least, unfairly assailed, though the zeal of the writer, it is admitted, had some apparent reason in rumors "fast and thick" concerning the appropriation of a few rooms for the preservation of important records, which could no where else be preserved, and which only were taken upon the fullest consultation with the friends and acting head of the Patent Office, the President himself exercising a personal and supervisory interest. I receive and read your valuable journal regularly—am an inventor—therefore justice to the cause you advocate induces me to request the insertion of the following: The Patent Office is not the property of inventors exclusively, but very largely the reverse—see the Secretary of the Interior's Report for 1853, as follows: "The amount thus far expended and appropriated (for building the Patent Office) is $1,367,750, of which $1,048,750 has been paid out of the Treasury, and only $319,000 out of the Patent Fund." Besides this, near $300,000, it is believed, has been further appropriated out of the Treasury, and that by the sanction of the present head of the Interior, towards the further construction of the building. Therefore, should any man, having the best interests of science and the promotion of the useful arts at heart, find fault? It is time enough when the least retardation of our business occurs. So far, this has not been the case in the slightest degree. I have conversed with the Examiners; they say, and I know it to be so, that neither their rooms nor their duties have been at all affected, whilst the models, model rooms, in short, everything pertaining to, and touching the interests of the inventors, remain intact, and this in accordance with the personal feelings and expressed wishes of the Secretary, as a further illustration of which, his Reports for 1853 and 1854 will amply vouch, and those who know anything about it, will say that nothing but urgent necessity would have caused him to have secured the small room occupied by the Indian Bureau, unless for the safe keeping of its archives, which contain evidences which but too many would rejoice to see obliterated. In conclusion, permit me to say that the idea suggested in one of your late No's. of an independent Bureau of Patents, is worthy of consideration, and sound reasons why may form the basis of another communication. JUSTITIA.

### Reply.

The above is a very lame defence of the Secretary of the Interior; but we have no doubt that it is the best and only one that can be conjured together. He says that the Patent Office building does not belong either to inventors or to the Patent Office Department, because Congress ordered its erection and the people paid for it; ergo, the Secretary has the right to turn the Patent Office out of doors, break up its business, suspend its operations, and cut the whole concern adrift; and he will do it, no doubt, if allowed to keep on much longer at the rate he is going.

How absurd the reasoning looks when applied, as it may be with equal justice, to any of the other Departments. There are the Treasury and State Offices, for example, noble buildings, built by order of Congress, and paid for out of the public treasury. Those Departments have no stronger claim to the occupancy of their respective buildings than has the Patent Office Department to the structure specially set apart for it. The Secretary of the Interior would not dare to molest, or even suggest to the heads of either of the Departments first-named, that they had no right to occupy the rooms ordered for them by Congress. Yet why not experiment on them as well as on the Patent Office?

The Secretary of the Interior, it is claimed, recommended an appropriation for the further extension of the Patent Office; this is presented as evidence that he is the "best friend" of the Department and inventors, not their enemy, as charged by the SCIENTIFIC AMERICAN. What a noble and generous act, truly, for the Secretary to recommend an enlargement of the Patent Office—and then take possession of it himself! What a benevolent and self-sacrificing individual he is, to be sure!

We have all along insisted, as our readers well know, that various acts of the Secretary relative to the Patent Office, of which we have complained, would, necessarily, have the effect to retard and confuse the operations of the Department. We have charged him with utter incompetency so far as related to its management; and we have called upon the President to take the reins out of his hands and appoint a new, vigorous Commissioner. Our friend "Justitia" thinks it will be time enough for us to complain when the least retardation of business occurs. "So far," he says, "this has not been the case in the slightest degree."

We are surprised that the Secretary should permit any of his friends to promulgate such a glaring untruth as the above. Let any one look at the scanty list of patents which appear in our this week's journal, and see for himself what an alarming falling off in the business of the Patent Office has taken place. Let him look back for the past two months, and he will see that this decline has a steady downward progress. Three months have barely elapsed since Commissioner Mason retired, and Secretary McClelland assumed the dictatorship of the Patent Office, yet within this brief space of time, the amount of business performed in the establishment has fallen off nearly *fifty per cent.*; new business has, all the while, been pouring in with undiminished volume, but receives only partial attention; new applicants are subjected, in many cases, to outrageous delays; unfinished affairs remain in *statu quo*; the concern appears to be fast choking up, and has, apparently, almost come to a stand-still. These facts speak out in thunder tones of condemnation against the Secretary of the Interior. They establish, alas! too fully, the correctness of our assumptions. With such evidences staring him in the face, "Justitia" will find a fruitless task in apologizing for his "best friend" of the Patent Office.

### Great Ocean Steamers.

The *Persia* steamship belonging to the Cunard line, recently launched at Glasgow; the *Adriatic* belonging to the Collins line, and the *New York*, belonging to C. Vanderbilt, now building in this city, will be, when completed, the largest merchant-steamers in the world. They will be about 5,000 tuns burthen each, and will afford ample opportunity for proving the quality of each in the contest for the mastery of the Atlantic. The hull of the *Persia* is of iron, and her engines are to be the side lever kind. The *Adriatic* and *New York* are being built of timber. The former is to have large oscillating engines, the latter beam engines. The keel of the *New York* is straight, and so are all her water lines, and her center of displacement is amidships; the *Adriatic* has hollow water lines, and has her center of displacement 20 feet abaft midships. The former is built much stronger than the latter, and has more capacity for cargo. It is believed that the *Adriatic* has the finest formed hull for speed, and that it will be the fastest steamer afloat. Time, however, will try them all; their comparative performances will be of great importance to the commercial and engineering classes of all countries.

### Durability of Iron Ships.

The iron ship *Richard Cobden*, which was built 12 years ago, at Liverpool, will repay a visit from any one who is interested in iron ships. She has been 12 years in the East India trade, and has not had the slightest repairs done to her; has never made a drop of water, and will, to all appearance, last for an unlimited length of time. This vessel has completely set aside the old notion of A 1. for 12 years. —[Liverpool Mail.

### Military Literature—America Ahead.

The following clever extract is from the *London Atheneum*:—"American papers are remarking on the absence of all literary effort in the Crimea, and are therein noting—very much to their own glory—a characteristic difference between the surroundings of an American and of an English army. The contrast is fair.—The self-laudation is not unjust. Our readers know that when the Yankees marched into Mexico they carried with them a printing press, and published a newspaper along the line of invasion. Across prairies, through dangerous passes, over mountain ranges, sometimes on mules, oftener on men's shoulders, occasionally in wagons—traveled press, paper, type and ink—editors, contributors, and pressmen—fighting, foraging, writing, working onward. Infinite were the uses of the press. It carried orders through the camp. Every morning the soldier read in it the story of the previous day. It anticipated the gazettes. It disseminated orders of the day; it perpetuated the gossip of the camp; reflected public opinion in the army; made known every want; supplied every information; exercised, inspired, and animated every heart. Had the Americans been in the Crimea, they would have had daily papers at Balaklava, Eupatoria, Yenikale, and Constantinople; and these papers reflecting the humors, incidents, and life of the camp—would have ranked among the best historical documents on the war. As it is, our soldiers in the Crimea are indebted to the London journals for authentic information of what occurs in the camp itself, and within a mile or two of their own tents. Jonathan is far ahead of us in some respects."

### Benefits of the New Steamboat Law.

The "New Steamboat Law" works well on the Western rivers, as is seen in the great diminution of the number of fatal disasters. The inspectors at New Orleans report, that during the year ending September 1st, the number of boats subject to their inspection have carried six hundred thousand passengers; yet there has not been an explosion of a boiler or collapse of a flue, nor have any lives been lost on passenger boats from the effects of steam or collisions. The report at Cincinnati is almost, if not quite as favorable.

The steamboats on our Western rivers, which before the new law went into force, were justly considered no better than floating magazines of destruction, have become as safe and well managed as any steamboats in the world. We challenge the steamboat records of any other part of our country, or any other country, to show such an immunity from accident, such safety of life, as the report of the inspectors on the Ohio and Mississippi rivers for last year. Three years ago the public were horrified almost every week with the terrible details of Western steamboat explosions; now 600,000 passengers have been carried during the past year without the loss of a single life; what a happy change. The inspectors deserve great praise for the manner in which they have performed their duties, and we hope they will never cease to be vigilant, strict, and fearless in enforcing the law.

### Lanterns for Lighthouses.

The Philadelphia *Ledger* states that Messrs. Merrick & Son, of that city, are now making three great lanterns for lighthouses on the coast of Florida. The largest—12 feet in diameter by 10 feet in hight, is intended for the lighthouse on point Jupiter. This lantern is of iron, and is to contain the purest plate glass. It will contain a Fresnel light of the first magnitude. A second lantern is for the lighthouse on Cape Florida, and will contain a Fresnel light of the second magnitude. This lantern is 10 feet in diameter by 8 1-2 feet high. The third is designed for the iron lighthouse on Coffin's Patches. The foundry of Messrs. M. at this time presents a busy scene, there being 470 workmen engaged in its several departments.

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### Recent Foreign Inventions.

WEAVING LOOMS—James Bullough, of Accrington, Lancaster, Eng., has taken out a patent for preventing broken warp threads becoming entangled in the shed of a loom. He employs an extra leaf of *healds* placed behind the ordinary harness, and gives to this leaf a motion backwards and forwards between the yarn, making them act like a comb, to throw back any ends of broken yarn from being carried forwards to obstruct the proper shedding of the warp. The improvement is a good one.

GALVANIZING IRON—Iron is covered with a coating of zinc (usually called galvanizing) by first removing all the oxyd from the iron, then dipping it into a solution of salammoniac, and from thence into a pot of molten zinc. Instead of using salammoniac for preparing the iron to take up the zinc, Wm. Hunt, of Tipton, Eng., has taken out a patent for the use of the chloride of zinc as a substitute. The chloride of zinc is formed by dissolving zinc in hydrochloric acid. This is used in a diluted state as the *mordant* of the iron to be galvanized.

SMOKE-CONSUMING FURNACES.—John W. Slaughgrove and J. H. Wheatly, engineers, London, have obtained a patent for a new furnace to consume the smoke of bituminous coal. The furnace is fitted with two sets of grate bars slightly inclining upwards towards the back end. Between the front and back set of bars a hollow perforated movable bridge or partition is fitted, and connected with a lever, by which the fireman can move it up or down. When this bridge is depressed, access may be readily had to the back bars from the front ones. A bright glowing fire is kept in the back bars or grate by pushing back the incandescent fuel from the front one. After the back grate is supplied with glowing coals, the central bridge is raised, and all communication between the two fires is cut off, except through holes or perforations in the bridge. When fresh fuel is thrown on the front grate, a large quantity of unconsumed gases are immediately evolved, which, in passing through the perforations in the movable central bridge, are there mingled with a current of warm air coming from below the furnace through the hollow part of the bridge, and then pass in streams over the back fire, ignite and are consumed—in other words, converted entirely into carbonic acid gas, with a great development of heat. A door is placed behind the furthest set of bars for the purpose of cleaning out the back furnace. The construction of this smoke consuming furnace will be clearly understood by every engineer. The improvement appears to be a good one, and will, no doubt, effect the object contemplated.

ENLARGING AND REDUCING MAPS AND DESIGNS—James Murdock, of London, has taken out a patent for the purposes above-named. The invention consists in transferring a map or a design to a sheet of india rubber in an unstretched state; then stretching the material equally in all directions, by having it secured in an expanding screw frame. This process enlarges the map or design. To make a design or a map smaller, it is transferred to the india rubber sheet when it is in a stretched state, and it is afterwards allowed to contract equally on all sides. The inventor is a French artist; many beautiful samples of his invention were on exhibition at the Paris Industrial Fair.

GLOBES—Alex. Clark, of London, has obtained a patent for making terrestrial and celestial globes of hollow glass, having the paper segments, representing the earth's surface, or of celestial bodies, pasted on the inside.

BLEACHING OILS, RESINS, &C.—A patent has been secured by Wm. Score, of Bristol., for causing oils, fats, and resins, when in a heated state, to be thrown by centrifugal force through fine wire gauze into an enclosed chamber containing chlorine. The apparatus is like a centrifugal sugar pan surrounded with a metal chamber containing the bleaching gas. A slide is employed to shut off communication, (when required) between the revolving pan and the bleaching chamber.

### Barlow's Planing Machine.—Erratum.

The date of the patent for the above named machine, illustrated in the SCIENTIFIC AMERICAN of last week, is stated to be the *first* of July last; it should have been *thirty*-first.

### The Yellow Fever.

At a recent meeting of the New York Academy of Medicine, Dr. Stowe, a distinguished surgeon of New Orleans, was introduced, who gave some valuable information respecting the above terrible disease.

In his opinion, yellow fever is a specific disease, the same every where, unmodified by topographical causes or changes of climate, but under all circumstances the same, identical and unchanged. When the fever is epidemic anything which disturbs the system develops it; at such seasons it is impossible to have any other disease. At such times many have the disease in a light manner—known to be such by the symptoms peculiar to its convalescence—yet such never have it again. Even accidents and injuries occurring at such times are sure to be followed by yellow fever in from twenty-four to thirty-six hours.

Many attempts have been made by statistics to discover its cause, but, like cholera, it escapes observation. Warm climate is an essential. A continued heat at a certain high degree was once supposed to be essential, but this is now disbelieved, for in 1847 it commenced early; in 1853 earlier—say in the latter part of May and June, when there was no steady heat. Moisture seemed not essential, for it raged equally in the high lands as the low, where the dry trade-winds blow, or where the air was damp. New Orleans has daily showers at certain seasons, and yet without any disease. This year it was very dry, and the sugar cane died for want of moisture, and all were suffocated by dust when the disease first appeared. It is not produced or augmented by filth or unwholesome air; it is a deterioration of the vital powers from some unknown cause. Frost does not check the disease. As a general rule, when the epidemic came early it left early, and when late it left late. The disease has never renewed after it has ceased, by the return of people from their summer retreats, as it would if contagious.

Some believe in its contagion, but it is incapable of generating its own poison under any circumstances, were it so, being such a specific, marked, and formidable disease, it could not but be evident. It is all around us, and we cannot so well observe as in smaller districts, where this fact is plainly to be proved. A vessel from Bremen, bound to New Orleans with emigrants, which came from the south side of Cuba, and when a hundred miles from land took the fever, and many died. On landing, some thirty were sent to the hospital, and many died—no one else took the fever. When the Charity Hospital was moved, the house was crowded, and beds were laid on the floors and in the entries, &c. Many died of yellow fever, the beds covered with excrements laid in the passage, but there was no epidemic in that neighborhood, and those lying around—the unacclimated—did not take the disease.

Its epidemic character is almost undisputed. It would sometimes seem to be contagious where it was not—as, for instance, the moral effect of one case occurring in a family is sufficient to cause all the other members to take it—but only in the yellow fever region. Any excitement at such times was sufficient to create or develop it. It was noticeable among the unacclimated—the northerners and others who united together for self-protection, the nurses and assistants were the last to take it, while the timid, who shunned infected localities, who sneaked off to bed, who feared the night air, who deprived themselves of exercise by their seclusion, were by these mental cares the first to receive it. In Norfolk, recently, it was believed at first not to be personally contagious, but all felt that they were shut up, obliged to stay and perish, and the moral effect was disadvantageous. They did, however, in some instances, attend to their own relatives, but others were unnursed and neglected.

This disease has literally no anatomical character—it is a blood poison. In yellow fever proper there are no traces left to account for sickness or death. Occasionally there are engorgements from the sequalae—but none to account for the black vomit, &c. There was, in fact, no irritability or tenderness of the stomach, but simply hightened nervous sensibility.

Yellow fever is a self-limited disease; it is not to be treated—it is to be managed. All that is to be done is to keep the patient alive for a certain time, and he will get well.

The disease is ushered in with a chill or slight rigor, often scarcely noticeable, followed by heat in forehead, pain in head, limbs, and back. If carefully treated, these symptoms will quietly terminate gradually in two or three days, but if they get hot and dry, in from five to seven days, collapse, black vomit, and death result.

Among those who may be said to understand the disease, there are two methods of treatment; the expectant—cups to temples to relieve cephalalgia, slight laxatives to open the bowels, hot baths under the bed. Others give quinine, a remedy which Dr. Stowe regards as the best. His method is to give a full dose of fifteen or twenty grains, according to the cir cumstances at the outset, perhaps ten grains more 12 hours after, but none unless on the first day; and the second day it is entirely useless, and after that actually injurious, although they bear it better than any other remedy. It causes vomiting when given late, and is not necessary, for its effects last several hours after its administration. Dr. S. thinks that the use of calomel should by all means be avoided. He knew this, for he had followed the patients of the calomelites to the dead house in plenty.

There are some peculiarities in the disease that might not at first strike one—the disturbed nervous system, and especially delirium, is one of the worst symptoms. This may appear at first but not usually. Its first evidence is restlessness and want of sleep; objects are seen as in *mania-a-potu*. Narcotics produce stupor and death, for the patients with this disease are peculiarly susceptible to morphine; stimulants are much better. You must watch to give the stimulants as early as possible; they then sweat off, and are relieved in 24 to 36 hours; but even then they must not be disturbed; if raised up they faint away. Perfect and absolute rest, body and mind, are indispensable. If patients become excited, the heat returns, and they die. Watch for sleeplessness, and give minute anodynes and stimulants. Give those agreeable to the palate. As they approach the black vomit period with previous restlessness and acid secretions, give some alkali, with minute doses (say a 20th or a 30th of a grain) of morphine, with champagne, ale, beef essence, &c. Impart to the patient a feeling of safety and security. The patient is to be managed, not treated.

Foot-baths under the clothes will often produce favorable sweats. When in dry heat, forced perspiration is bad; sponging with tepid water is then better. The douche is but of temporary benefit, and the subsequent reaction leaves the patient worse. Sponging with lemon juice, sweet oil, and salt are used, but pure water is better. Careful covering of the entire body and limbs is absolutely requisite, but not to swelter under too much covering. If the hands were but exposed sometimes, the heat would return and a relapse ensue. Some mild diaphoretics may be given; such drinks as the patients desire, one year all want brandy and water, other years malt liquors. Give that which is desired, and carefully avoid even the nervous shock caused by a bitter or disagreeable medicine. Sponging the body under the clothes, ice water to head, generally was followed by reaction and more pain. Dr. Cartwright had pursued the opposite plan of enveloping the head in warm fermentations.

The recent Norfolk epidemic was the identical yellow fever seen the same in every locality, but in a severer form than ordinary. It first commenced at Rio in 1851, thence spread throughout Brazil, Para, northern part of South America, going into the country and the small villages; into the plantations heretofore unknown to be ever affected, attacking negroes (generally enjoying immunity,) into the pine woods of Alabama and the hights between this State and Georgia, the next year throughout Georgia and South Carolina, this year in Memphis, (where never was before epidemic,) and Norfolk. It is creeping over the country, and there is some reason to fear (why, cannot be said,) that next year it may reach New York.

Dr. Stone is a man of close observation and great experience in the treatment of the yellow fever, having practiced in New Orleans for over twenty years. His opinions are entitled to careful consideration.

Alas! how terrible is the very thought that a great and populous city like New York is perhaps standing in the pathway of this fearful king of terrors.

Inoculation for the yellow fever is reported to have been tried in more than one thousand cases at New Orleans, during the past summer, with perfect success.

### New England Industrial Exhibition.

DEAR SCI. AM.—The above exhibition, under the patronage of our Mechanics Association, was opened to the public on Monday, last week—the 22nd—but the machinery was not properly arranged until Thursday. The display, however, has made amends for the delay; as it is no doubt the best ever witnessed at any Fair in venerable Boston. The display of tools, of every description, was never equalled, and I have always noticed that the quality of tools used by mechanics is a very good index of their skill. It is impossible for me to pay a tribute of respect to all the machines exhibited. I can only state in a general way, that they were very good, and that quite a number of them had been illustrated in the SCIENTIFIC AMERICAN, and on that account were more conspicuous. This was especially the case with Gallahue's boot and shoe pegging machine, which was illustrated on page 25, Vol. 9, SCIENTIFIC AMERICAN; it was a special object of attention by the sturdy shoemaker's of Lynn, who have visited the Fair in great numbers.

Distinguished as the New England mechanics have long been for all kinds of manufactures, and for mechanical skill, this Industrial Exhibition affords abundant and pleasing evidence that they are not content with the reputation they have acquired, but are determined to aim at higher and nobler results. The machinery from the famous machine shops of Lowell, Taunton, Worcester, &c., display many improvements in finish and construction. The exhibition will continue open for one or two weeks longer, and I may be more minute in a future letter.

R. R.

Boston, Oct. 27, 1855.

### National Agricultural Exhibition.

The National or United States Agricultural Society, composed of members belonging to all parts of the Union, held its Annual Fair at Boston last week, and was the greatest ever witnessed in our country—60,000 persons being on the ground at one time. There was a cavalcade of 517 cart horses in a single line; and never before was there seen such a display of live stock. The oxen and cows, Ayrshires, Durhams, Devons, &c., were the admiration of all the beholders. A New York horse named "Genesse" gained the first prize, $200, for speed. These exhibitions are intended to excite our farmers to improve their stock and everything connected with farming. They deserve to be well patronized, for their objects are good.

### Mechanics Institute.

The opening lecture of the course to be given under the anspices of this Institute was delivered on Thursday evening last, at the Academy of Music, by the eloquent Thomas Francis Meagher. The large room was filled, and the audience seemed highly pleased with the orator and his lecture.

Some of the most eminent men of the country are engaged to continue this course of lectures, and we hope the public will yield to them a hearty support. The Mechanics Institute is one of the most noble in our city, and deserves to be patronized by all our mechanics.

### California Minerals.

The *Citizen* says: "Recently in El Dorado County an immense bed of arsenical ore is said to have been discovered. Beautiful variegated marble has also been found in the same County, and in Yuba, a mine of genuine coal has been found, and preparations are now being made to work it. That silver exists in considerable quantities throughout the State is well known, and platinum has been found in various portions of it. The quicksilver mines of New Almaden are the richest in the world, and fine specimens of cinnabar have recently been found in Mariposa County, and doubtless exist in other portions of the State."

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# New Inventions.

### Important to Mechanics.—Woodworth's Planing Machine.

United States Circuit Court. John Gibson agt. Joseph Dart, Jr., C. A. Van Slyke, and others, Judge Nelson presiding. This was a second application by the representatives of the Woodworth patent, for an injunction against parties using a molding machine, known as the Fay Molding Machine, or Fay Sash Sticker. The former decision was published in this paper in April last.

The application was renewed, and resisted on additional papers, and was argued at the last July term in this city. The Judge has again decided in favor of the defendants, and a rule denying the injunction was entered in the office of the Clerk of the Northern District of New York on the 20th inst. This decision is of great importance as there are more than 3000 people in this State, it is said, who are using Fay's machines.

### Improved Gang Saw Mill.

The annexed figures are a front view, fig. 1 and a side view, fig. 2, of an improvement in Gang Saw Mills, for which a patent was obtained by Isaac Brown, of Baltimore, Md., on the 19th July, 1853. An illustration of the single saw mill was given in Vol. 10, No. 37, page 292, of the Scientific American.

A A are the fender posts, to which the cylinders are firmly bolted, forming the bed plates, also the slides for the cross head or saw sash to work against. They are firmly secured together at the top and near the bottom of the saw sash, and bolted down to heavy foundation timbers, which makes the whole of the combined mill and engine very firm and substantial. B represents the saw sash with a center support, allowing it to be much lighter and of sufficient strength to carry two gangs of fifty saws at one time. One space only is shown, filled with saws, whilst the other space shows the position of the log without the saws, with the rollers for forwarding the logs to the saws when in operation. This saw sash is also the cross head of the engine, which receives its motion from the piston rods on each side. The pressure is equally distributed, and each part bears its due proportion of strain. There is no part overloaded, or liable to heat. The pistons, connecting rods, and fly-wheels thus operating the saw sash, the weight of which and the saws are lifted by the power of the steam in the downward stroke, adds power to be expended to cut into the timber, thus exerting the greatest force at the moment required, and that in the saw sash itself, without having to be transmitted through belts, gearing, or connecting rods, at a great loss by friction, wear and tear, &c.

C are steam cylinders of the usual form, with stuffing boxes and glands at each end; the steam chests are in the angle inside the frame. D are the connecting rods or pitmans. E E are fly wheels; they are turned and used as pulleys for operating timber hauling apparatus, pumps, edging saws, and any other purpose required for the operations of the mill. F F are crank pins, firmly secured in the fly wheels. G G are piston rods passing through both heads of the cylinders, and by the glands and packing are guided to work true, with the ends resting on bearing surfaces near the point of connecting at the top, and at H on the lower part of the saw sash. The piston rods are made so short that when expanded by steam they will fill the space between these two points of bearing, allowing them to work free and unrestrained, and effectually preventing their working out of line or allowing the pistons to revolve within the cylinders, thus securing them from cutting or unequal wearing. I is the engine shaft, performing the office of crank shaft, and is firmly secured in pedestal bearings, resting on the engine frame, thus securing the whole substantially together. J is the exhaust pipe conducting the steam to the heater below, and heating the water to be forced into the boilers from the pumps. K is a rock shaft, giving the desired motion by means of proper connections with the eccentric, L, to the valves in each steam chest. M is an eccentric giving motion to the feeding apparatus by means of the rock shaft and eccentric rod, O; and it is so arranged that the speed of the cutting for either gang of saws may be adjusted at pleasure, or the motion of one or the other reversed, as may be desired. N are ratchet stock and gear wheels giving motion to the feed rolls, and carrying the logs forward to the saws. P P are feed rolls, with teeth arranged to be taken out when required, for sawing flat sided timber, or when it may have been sided down by one set of the gang saws and requires further sawing to make square dimension timber cut to order, such as deals, and other sizes. Q represents top pressure rolls, arranged with an adjustable lever to accommodate the varying sizes of logs; they have teeth for holding round logs steady, and may be taken out when sawing flat timber. R R are trucks moving on rail tracks, and so arranged with right and left screws to tighten the logs, hold them firmly, and guide them in the proper direction while being sawed. In operation, as the logs pass to the saws, one truck is disengaged and backed to receive another log, by which means a continuous cut is kept on the timber while the saws are in order, or until they need adjusting or sharpening, which is generally performed once a day, and before starting in the morning. S S are levers, to which the weights are attached to give the pressure required to hold the timber while being sawed. T is a pulley for using the surplus power for any other purpose required. U U are pumps, so arranged that one is kept in reserve, allowing the bringing of it into use in the case of the other failing to work from any cause. In pumping up to the boilers by hand power, both pumps are used, and the log wheel gearing serves as a well arranged capstan, whereby the pumps can be worked, by bars, with great facility; the large pulley X, acts as a fly wheel, giving steadiness to the stroke of the pump. V is an upright shaft, around which the chain winds to haul up the timber from either direction to be sawed. W is a bevel wheel, on the lower end of the timber-hauling shaft. It is driven by a pinion upon the pump shaft, and is arranged with a clutch to start or stop at pleasure. The pulley driven from the fly wheel gives full power to haul up the timber as fast as it is required for sawing. Y is a sheave on the engine shaft, by which scrapers are driven to remove the sawdust near to the front, to be shoveled under the boilers for generating steam. Z is a substantial timber frame around the engine, to which is secured the feed and pressure roller fixtures, and supporting the end of the rail tracks for the trucks. & are the foundation timbers upon which the engine and mill fixtures stand, the same being well locked by keys, and bolted together. The steam boilers are not shown, as their location can be varied as circumstances may require. The wrought and cast iron in this sawing machine amount to about fifteen tuns, and is of the most substantial construction. A first class saw mill of this kind is covered with a sheet iron roof to secure it from fire.

We have been informed that the cost of a mill of this kind complete, with boilers and all, does not exceed $500 for each 1000 feet of lumber it will saw in ten hours.

The claims of this patent will be found on page 296, Vol. 8, Scientific American. It has never before been so illustrated and presented to the consideration of the public.—Every improvement in saw mills is of great importance to our country.

More information respecting it may be obtained by letter addressed to Mr. Brown, at Baltimore.

## BROWN'S DOUBLE GANG STEAM SAW MILL.

Fig. 1

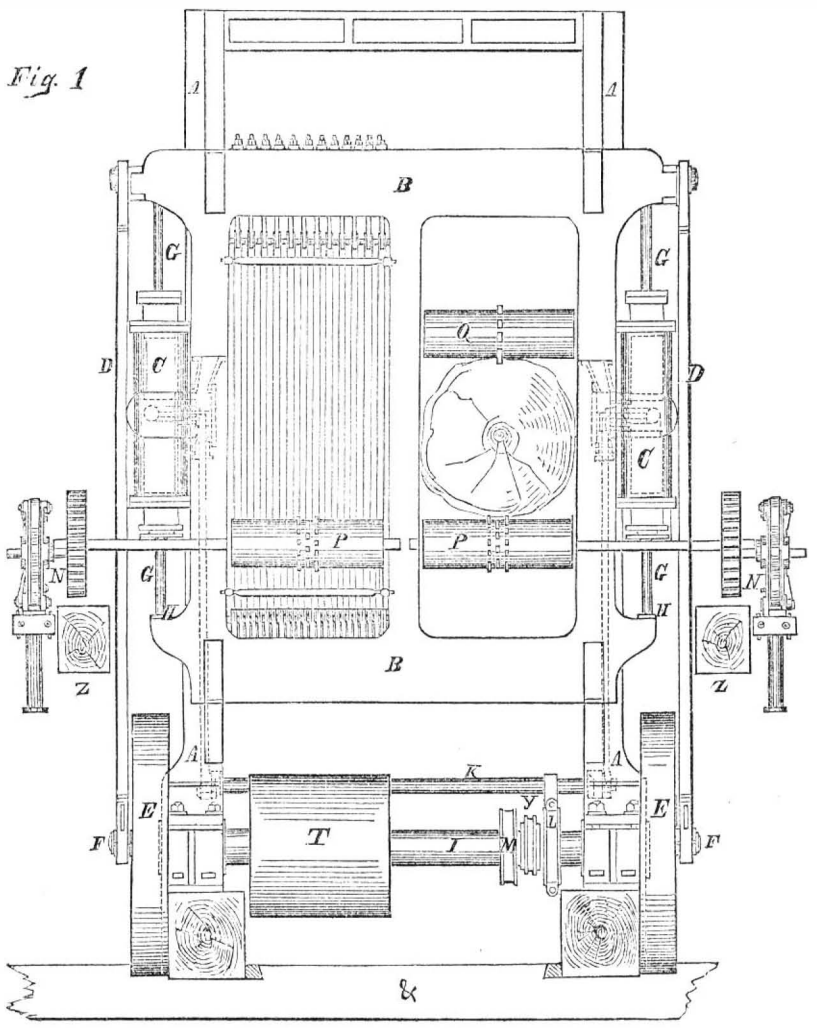
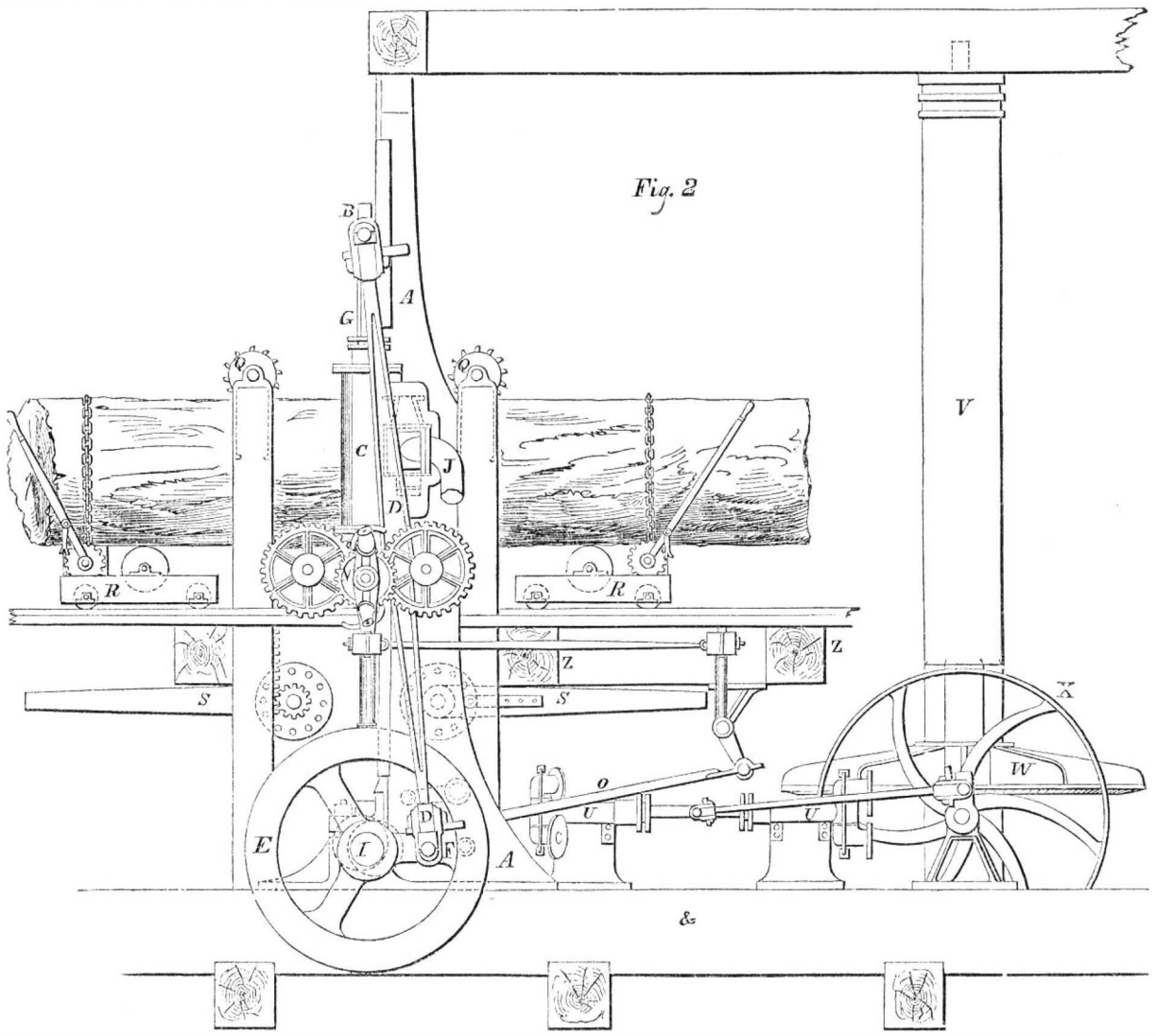



Fig. 2

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# Scientific American.

NEW-YORK, NOVEMBER 3, 1855.


### The Woodworth Patent Again.

It will be fresh in the remembrance of our readers that an attempt was made during the session of Congress for 1851-2 to procure the extension of the Woodworth Patent from Dec. 4, 1856, to Dec. 4, 1870. This attempt, like the one made at a previous session, was unsuccessful.

The Committee on Patents in the House of Representatives, made an able report on the 17th July, 1852, and, if we mistake not, it was unanimously accepted. It scorched this monster so thoroughly that not a pin feather was left on its carcase, and it was confidently believed that no attempts would again be made to foist it upon the forbearance of Congress.—The public, sensible of the monstrous injustice that would be done if this patent should be prolonged, besieged Congress with remonstrances, and the august legislatures of several States formally protested, through their representatives, against it. Another instance of the kind does not exist in the whole history of patented inventions, where legislative bodies and the public have so unanimously opposed to prevent the extension of a patent. This is enough, in itself, to satisfy any reasonable mind that scarcely a shadow of reason can be found for a prolongation of this patent, which has already existed nearly 27 years. We have lately been informed, from a source that leaves but little doubt of its truth, that efforts are in progress on the part of the owners of the patent to procure its extension at the next session of Congress. "Now or never!" is the motto under which they advance with their schemes, because when the patent expires, as it will in December, 1856, all hopes of future success will be blown into oblivion.

It does seem to us that this new attempt on the part of the assignees of this patent is marked with an audacity without parallel, and it would be a meritorious act if, when the application is presented, Congress should kick it out, and bid the schemers to be off at once with their unwarrantable intrusions. No Member of Congress who values his reputation as worth one straw, would lend his aid in perpetuating a monopoly which has been, and is now, not only severe, but outrageously oppressive upon a great number of honest and worthy patentees and manufacturers in our country. We are now told, with unblushing effrontery, that the facts embodied in the Committee's report are all gammon, and that the special opponents of the last extension, those who labored hardest to collect the strong array of facts that abound in the Committee's report, are now clamorous in its favor. Patentees of planing machines who have smarted under the galling yoke of litigation with the Woodworth assignees, are now converted, and are ready to swear that the further extension of this patent would confer untold advantages upon the country. We can believe this, in fact we know it, but it does not add much to their reputation as honorable men. If they have been crushed out or bought over to the enemy's interests, we shall not shrink from our duty in exposing their machinations, and the schemes they are assisting to carry forward to swell the calendar of litigation, and break down every inventor who shall dare to invent and operate a machine that may interfere with their interests.

We shall continue to ply the lash of opposition to this scheme until all hope of its success are "clean gone for ever," and if it fails during the next session, the public will have no occasion, we think, to be re-warned to resist it. To accomplish this result, however, strong efforts must be made throughout the whole country to procure remonstrances against it, and to aid those who have an honest desire to oppose, for the last time, a scheme so monstrous, we shall print, in our next number, a suitable remonstrance that will embody important general facts, and we request that it may be copied and circulated for signatures from one end of the country to the other, and sent in to Congress as early as possible. Let the sovereign seal of public indignation be felt once more upon this subject, and its end will be glory enough for one day at least.

### Reminiscences of the Paris Industrial Exhibition. No. 4.

Generating Steam by Friction—It is well known that heat can be generated by friction as well as by chemical action—the combustion of coal or wood. And as the combination of heat with water produces steam, it follows that the heat of friction will generate steam as well as the heat of a fire. Acting, we suppose, upon the principle that the heat of friction costs nothing, because no fuel is consumed in the process, two French inventors, MM. Beaumont and Major, exhibited a "thermogenic apparatus," for raising steam by the friction of rubbing surfaces. It consisted of a cylindrical boiler six and a half feet long and about nineteen and a half inches in diameter. Through its whole length was placed, centrally, a large conical tube surrounded with water, and into this was fitted a long cone of wood covered with a braid of hemp rolled on it spirally. The wooden cone received a rapid rotary motion, which made it rub constantly on the inner walls of the tube, thereby generating considerable heat, which was taken up by the water, converting the latter into steam. When the cone was set in motion the heat of the boiler gradually increased until it attained to 212 degs. Fah., when steam began to form, without fire, and a sufficient quantity was produced to drive an engine of one-horse power. The pressure of steam was kept at 45 lbs on the square inch; oil was conveyed by a channel to the cone for lubrication, and the amount of water contained in the boiler was about fifteen cubic feet. The machinery to revolve the piston cone was driven by water amounting to two-horse power, and the boiler generated steam of only one-horse power; yet it appeared to us that the inventors could not be made to understand that, although they used no fire, their friction steam apparatus was decidedly an expensive machine in comparison with a genuine *fire raiser*. The plan is just as sensible as would be the employment of a steam engine to pump water to an elevation for the purpose of driving a water wheel. Those French inventors might have seen that by throwing away their friction boiler and engine they could have derived more power to propel useful machinery direct from the water they used, than from the steam generated by friction. We remember some experiments of a similar nature that were tried in New York some years since, and it is not a little amusing to see them repeated in another part of the world, with the same result.—It is evident that if a saving could be effected by generating steam from friction, perpetual motion would no longer be a problem, as the re-action would thus be greater than the action. The reason why steam is an economical power is simply because it is produced by chemical decomposition, and not mechanical labor. We were informed that the Emperor had assisted these inventors, out of his private purse, in bringing their apparatus to its present state of perfection. He is known to be a friend to inventors, but in this case his better feelings were not guided by a knowledge of mechanical philosophy.

Magnetic Boiler Gauge—A common safety alarm used in steam boilers, consists of a float attached by a rod to a safety valve, which, when the float falls below the water line, opens the valve and lets out the steam, to act as a whistle. M. Lethuillier Pinel exhibited such a gauge, with a magnetic attachment, which indicated the hight of the water in the boiler at all times. The copper float or hollow spheroid in the boiler was connected to an iron rod, in which was secured a powerful magnet; another rod—which had a knob on its lower end—was connected above to the safety valve. The float rod was guided by a fork on the valve rod to rise nearly to the top of the boiler, but when the float sunk below the water line its rod caught the knob on the end of the valve rod, and drew it down, thereby opening the valve and allowing the steam to escape. The chamber containing the rod and valve consisted of a small brass cylinder, situated on the top of the bolier, divided vertically into two compartments by a brass plate, and the front compartment was provided with a glass window marked with figures, to indicate the depth of water in the boiler. The back compartment contained the magnet beforementioned, and the front compartment the pointer, which consisted of a small armature having no mechanical support, but held to the surface of the brass partition plate by the attraction of the magnet acting through the brass, and sliding up and down on the plate behind the graduated window as the magnet rose and fell with the float. The magnet was therefore an indicator of the quantity of water in the boiler, while the float, as usual, operated the safety valve. We thought this invention a very neat and scientific one, although the same ends are obtained by a pointer on the float rod, when a stuffing box is used. We were assured that the heat of the steam did not destroy the power of the magnet, and that the one exhibited had been in use for three years without having its attracting force injured.

Jewels—One of the greatest objects of attraction in the French Exhibition were the diamonds belonging to the crown. They were arranged in the center of the Panorama building, upon an elevated dias, and so eager were the people to see them that it was found necessary to have a strong body of police stationed to compel the visitors to pass around them in regular file, and only half a minute could be allowed to take an observation at these sparkling gems. It may be interesting to some of our readers to know something of the value of these crown appendages, and from it they can approximate to some idea of the vast expense attending an imperial government. The finest of the crown jewels is the diamond known by the name of "Regent;" it was purchased in 1718 by Philippe II. Duke of Orleans, during the minority of Louis XV.; it weighs 136 carats, and is valued at about one million dollars. According to the last inventory, made out in 1832, the precious stones of the French empire numbered about sixty-five thousand, weighing over seventeen thousand carats, and were estimated to be worth six millions of dollars. The richest article in this inventory is a crown which has not less than 5206 brilliants, 146 rose-diamonds, and 59 sappires, the whole valued at three million dollars.

Next comes two swords, with 1500 rose diamonds each, valued at one hundred thousand dollars. A clasp with 217 brilliants, valued at fifty-four thousand dollars. A clasp for a cloak ornamented with an opal, valued at eight thousand dollars, and 197 brilliants, worth six thousand dollars; and a button for the hat worth sixty thousand dollars. Among the articles for ladies were four head dresses, estimated in value at three million seven hundred thousand dollars; and some wheat ears valued at forty thousand dollars.

There were several valuable pearl necklaces, besides minor objects of *bijouterie* that appeared insignificant alongside the grander ones. In the grand transept there was on exhibition a Brazilian diamond, valued at about two million dollars.

The whole amount of precious stones on exhibition could not have been valued at less than twelve millions of dollars, to say nothing of the immense display of costly jewelry—all to adorn the person and tickle the vanity of the vain.


### SPLENDID CASH PRIZES!

The proprietors of the Scientific American will pay in cash the following splendid prizes for the fourteen largest list of subscribers sent in between the present time and the 1st of January, 1856; to wit:

| | |
|---|---|
| For the largest List | $100 |
| For the 2d largest List | 75 |
| For the 3d largest List | 65 |
| For the 4th largest List | 55 |
| For the 5th largest List | 50 |
| For the 6th largest List | 45 |
| For the 7th largest List | 40 |
| For the 8th largest List | 35 |
| For the 9th largest List | 30 |
| For the 10th largest List | 25 |
| For the 11th largest List | 20 |
| For the 12th largest List | 15 |
| For the 13th largest List | 10 |
| For the 14th largest List | 5 |

Names can be sent in at different times, and from different Post Offices. The cash will be paid to the order of the successful competitor immediately after the 1st of January, 1856.—MUNN & CO., 128 Fulton st., New York.

☞See prospectus on the last page.


### GREAT FAIR OF THE AMERICAN INSTITUTE

**Third Week.**

Public interest in this excellent Exhibition continues, we are happy to say, unabated. The attendance of visitors has been large during the past week,—the average number of persons admitted averaging, we understand, ten thousand per diem.

The Fair will not close, we are informed, till about the second week in November.

**The Mechanical Department.**—[Continued.]

The various Committees paid special visits, last week, to examine the operating machines prior to rendering their awards. If we mistake not, there will be a pretty general sprinkling of high prizes, for there are but very few similar or mediocre inventions. The prizes will consist, as usual, of gold medals, silver medals, and diplomas.

**The Gas Engine.**

We regret to say that Dr. Drake has not yet succeeded in putting his new gas engine into successful operation. We saw it make some twenty or thirty revolutions the other day, and then come to a halt. Something is wrong, and every fresh attempt to start it seems to reveal some new defect. Unless the inventor succeeds in setting it a-going pretty soon, we fear he will lose a prize. Why does not our friend Secretary Meigs step in and help brother Drake? In this connection we are reminded that we have received a communication asking for light on the gas propeller, here it is:

Messrs. Editors—I see in your issue of the 20th a description of a Gas Engine, invented by a Mr. Drake,—but evidently described by a *duck*. It is stated that the ignition of the gaseous compound is effected by means of a hot iron. Now, any one that ever heard of Davy's Safety Lamp ought to know that hot iron is no more capable of igniting a gaseous mixture than cold iron. Will any one give me a correct account of how it is fired?

C. W. McCord.

Hackensack, N. J., Oct. 24, 1855.

[It will be a long time, we reckon, before the services of the above writer will be required to correct any errors of statement in the Scientific American. No one but a *goose* would have penned such remarks as the above. If he will take a poker, heat one end in his stove to a cherry-red, and apply it to the burner of an open gas pipe, his understanding will be suddenly illuminated. Sir Davy's lamp appears to have obscured rather than assisted his vision—the first bad result from that useful invention which has come under our notice.]

**The Cloud Engine.**

From some unexplained reason this machine has come to a stand still. It has been operated but very little during the week past, and has not been tested as we were informed it would be. We hope to give a better account of it next week.

**Sewing Machines.**

Four different kinds are on exhibition, and their operations attract much attention—from the ladies, especially.

*Howe's Machine*—the original of the shuttle sewing machines, is exhibited by J. B. Nichols & Co., No. 411 Broadway, N. Y. This invention is well known. It does good strong work; sews leather equally as well as cloth, with or without waxed threads. Price, $125.

*Wheeler, Wilson & Co's. Machines*—Office 343 Broadway, N. Y., is more especially adapted to fine work. In stitching shirt bosoms and the like it has no equal. The rapidity of its movement surprises everybody. Illustrations of this machine will be found in Vol. 6 of the Scientific American.

*Musical Sewing Machines*—Messrs. Wheeler & Wilson also exhibit some samples of a new article of furniture, in which their sewing machines are combined with a melodeon. The apparatus has the appearance, externally, of a small parlor side-board or escritoir. You lift the front and find a handsome set of piano keys. Close it, and turn back a hood on the top, and you have a complete sewing machine, conveniently arranged; concealed below, within side doors, are two pedals, one for the music, the other for the sewing machine. When the lady becomes tired of playing at sewing, she may change her foot to the other pedal, open the melodeon part, and discourse sweet music. The price of these contrivances is $200. They form very ornamental articles of furniture. Now exhibited for the first time. This combi-

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nation is the invention of Mr. S. H. Peck, No. 13 Charles st., New Orleans. The musical portions are made by Messrs. Carhart & Needham, N. Y., the celebrated melodeon manufacturers of this city.

*Wax Thread Sewing Machine.*—Some of the best work on leather that we have seen, was done by the recently patented machines of William Wickersham, exhibited by Horace Herrick, of No. 60 Hanover st., Boston. These machines might properly be styled "mechanical shoemakers." For boot and shoe making, and many portions of harness work they appear to be well adapted. Waxed thread of any size desired is used with perfect facility. There is an awl that first pierces the leather, and then the needle follows. Almost any number of thicknesses of the stoutest leather may be firmly sewed at once. It is said that a girl using one of these machines can side from eight to twelve cases of boots per diem. Price of machines $125.

*Robinson's Hand Sewing Machines, with Roper's Improvements.*—This is a very singular looking and acting apparatus. It puts us in mind of a hand printing press, more than anything else. Two needles are employed, carried by two long arms, one above, the other below the table. One thread, only, is used. There are notches near the points of the needles, answering to eyes, which catch the thread and alternately carry it through and out of the cloth, forming the same kind of stitches that are made by hand, to wit: back stitches, half and quarter back, side, sail, quilting, hemming, running, &c. The work which it performs is strong and beautiful. Price of machines $150. Now exhibited for the first time in N. Y. by W. H. Wilson, No. 348 Broadway.

### Lubricators for Machinery.

Messrs. Sutton & Gregory, of Nos. 114 and 116 Cannon street, N. Y., exhibit, for the first time, a variety of their improved Lubricators made under the two patents granted to Mr. John Sutton, Jan. 16th and 23rd, 1855; illustrated in the last volume of the Scientific American. These lubricators are of peculiar construction, being furnished with pistons so arranged that steam valves and cylinders of engines may be thoroughly oiled, at all times, under all pressures, without stopping or slacking the machinery. Used on the cylinders of high pressure engines, such as locomotives, they are said to effect a saving of seventy-five per cent. in grease, besides rendering the lubrication much more certain and perfect. The invention is very highly spoken of by many of the prominent engineers in this city.

Mr. A. W. Metcalt, No. 140 Center street, N. Y., exhibits a handsome case of steam whistles and lubricators of the ordinary construction. They present evident tokens of good workmanship.

### Harvesters.

Nine different inventions are exhibited, comprising some quite recent patents, and others, we may say, that have been through the wars and gained great triumphs. In making our observations we were unable to find a single attendant to explain the advantages and peculiarities of the machines, prices, &c., neither were there any circulars to be had. If exhibitors expect to profit from a large exhibition like the present, they should have some person always present to give information.

*Gale's Combined Mower and Reaper.*—In this machine the driver and counter wheels are both of the same size, so that there is no side draft. The frame of the machine is made narrower than usual, being only three and a half feet, but the width of the swath cut is five feet. There is a contrivance in front called the track clearer, which pushes the grass one side, so that the wheels run on the stubble and not on the cut grass. On the rear of the frame there is a handle, by which the cutters may be instantly raised to pass stones or other obstructions. Spur gearing is used throughout, which makes easy running. Altogether the machine is light, compact, simple, and substantial. We are much pleased with its construction. We have been informed that its success during the present season, has been great. It is a new invention. Now exhibited for the first time by Gale & Mills, Poughkeepsie, N. Y.

*Messrs. Dietz & Dunham*, of Raritan, N. J., exhibit a very simple mower, one of the peculiarities of which is in the mode of operating the cutters. One side of the rim of the driving wheel is scolloped, and against the undulations or cams, thus formed, a friction roller, attached to a vibrating arm, is pressed. The required horizontal movement of the cutters is thus obtained at trifling cost.

*Messrs. Wm. B. Hovey & Co.*, of Springfield, Mass., have one of their new mowers on exhibition. Patented July 3rd, 1855. The motion of the cutters in this machine is produced by undulating cams placed on the inside of the rim of the driving wheel. The invention is one of great simplicity, and the machine is apparently very light, effective and easy of management.

*Mr. John Smalley*, of Bound Brook, N. J., exhibits one of Whitnack's late improved mowers and reapers—a good and strong machine.

*Mr. Henry Waterman* of Williamsburgh, L. I., exhibits a simple looking mower. Spur gearing is employed to move the cutters.—Looks as if it would work easy.

*Atkin's* self-raking reaper, exhibited by J. S. Wright, Chicago, Ill., *Ketchum's* mower, price $110, exhibited by Howard & Co., Buffalo, N. Y., *Manny's* mower and reaper, exhibited by Adriance & Co., Worcester, Mass., *Allen's* mower, price $120, exhibited by R. L. Allen, 189 Water street, N. Y., are all good inventions, and well established in favor with the public.

### Improvements in Window Sashes.

A very simple plan of balancing window sashes, without the use of weights, is that patented by Mr. Alfred T. Clark, 1854. It consists in connecting both sashes together by cords and pulleys, the latter sunk in the window frame alone. When one sash goes up the other comes down; they balance each other perfectly. Exhibited by Williams & Smith, 84 Nassau street, N. Y.

*Ford's American Window* opens in two parts, like a French window; it is also balanced with weights, and slides up and down. These peculiarities, we are informed, permit better ventilation, are more convenient in fastening, tighter, and much cheaper, than the common French sashes. It is a good invention. Patented June 12, 1855.

*Ramsay's Model Balcony Window.*—This invention is not patented. It is for the same purpose, the same advantages are claimed, and its mode of operation is the same as Ford's invention, above noticed.

### Boiler Feeders.

The large steam boiler at the Palace is furnished with one of Clark's Patent Feeders and Indicators. It consists of a short horizontal metallic tube of say three feet in length and two inches diameter, suitably attached to the outside of the boiler, or to a wall near by. The hight at which the tube is placed should be the same as that at which it is desired to maintain the water level in the boiler. One end of the tube communicates with the upper or steam part of the boiler, the other end with the water part; when the water in the boiler is at the proper level the tube will be one half filled with water and one half with steam. A small cold water pipe passes lengthwise through the tube; one end of this water pipe is plugged tight, the other end is furnished with a metallic cup, covered with rubber, forming a diaphragm. On this diaphragm rests a plunger rod attached to a lever, the latter connected with the pump throttle. When the water in the boiler falls below the level of the tube, the latter will become wholly filled with steam and heat up the water pipe, forming steam in it also; the pressure thus produced in the water pipe will extend the diaphragm, raise the throttle lever and permit the pump to inject water into the boiler; when the water level is restored the tube again fills, in part, with water, the pressure on the diaphragm ceases, and the pump throttle shuts. This feeder is constructed on scientific principles. It works well, is strong, simple, and apparently very sure. Price from $25 to $100. It can be rigged to strike an alarm if desirable. Exhibited by Shiverick Malcolm & Co., owners of the patent, No. 134 Greenwich Avenue, N. Y. Illustrated in the Scientific American.

### Water Level Indicator.

The main boiler is furnished with two glass indicators. One of them is of the ordinary construction, consisting simply of a round glass tube, steam being admitted at one end, water from the boiler at the other. The hight of the water in the tube exhibits the water line in the boiler. These glass tubes are objectionable because they frequently crack and become useless.

The other indicator, invented by Mr. Joseph Echols, of Ga., is intended to stand a much greater pressure, and to be serviceable even if it should crack. Take a short tube of glass, divide it lengthwise into two parts, place the pieces back to back, set them in a metallic frame, and you have Echol's indicator. Steam is admitted at each end of the frame, as in the other apparatus. The pressure being against the convex or arched backs of the glass, the latter offer great resistance, and if cracked they press together so tightly as to prevent leakage. This is a good invention. An engraving of this apparatus appeared in No. 3, Vol. 9, Scientific American.

### Dovetailing Machines.

Mr. F. A. Gleason, of Rome, Oneida Co., N. Y., exhibits a remarkable improvement of his own invention, for dovetailing. The machine is quite small and simple, but without drawings we could hardly convey a correct idea of its construction. Two very small circular saws are employed, moved by a treddle, the whole concern occupying but little more space than a man's hat, and does the labor of 8 or 10 persons. It is applicable to cabinet making, carpentry, and every species of wood-work, with great effect. Packing boxes, and the like, may be put together more strongly and in quicker time than when nails are used. The saving of hardware is obvious. Price of machines $60 and $75, according to the size. Now first exhibited. Patented 1855.

*Burley's Dovetailing Machine.*—This invention executes the common dovetailing work in a very rapid and excellent manner. All the mortices or tenons, on one end of the stuff, are cut simultaneously. The work done is very strong, neat, and accurate. We are told that one machine will do the labor of 30 persons working with mallets and chisels in the ordinary manner. The improvement is adapted to all kinds of work, fine or coarse, and to every variety of stuff, hard or soft, thick or thin. Price of machines $300. Patented Jan. 2nd, 1855. Exhibited for the first time in the Palace, by S. P. Putnam, No. 2 Maiden Lane, N.Y.

### Blind Slat Tenoning Machines.

*Mr. E. W. Roff* exhibits an excellent machine, of his own invention, for cutting tenons on the ends of blind slats. Cutters are arranged on a small disk, against which the ends of the slats are pressed and clipped in an instant, leaving a smooth edge and round tenon. A very simple gauge apparatus serves to reduce all the slats to the same exact length D. S. Condit, agent, 74 Spring street, N. Y.

*Mr. C. B. Rogers*, of Norwich, Ct., also exhibits a machine for cutting blind slat tenons. It seems to be a good invention, simple and easily managed.

### Artificial Stone.

Several fine samples of artificial stone, comprising lintels, statues, busts, moldings, &c., are exhibited by the American Artificial Stone Co. They are made under the process patented by Mr. Thomas Hodgson, June 19, 1855. The composition consists of sand, plaster of Paris and blood, reduced with water to such a consistency as will permit pouring into molds of any required form. The composition hardens in a very short time and, it is said, increases in firmness the longer it remains combined, till at last it turns into solid stone. We are informed that the ornamental portions of stone buildings, columns, &c., are furnished on much lower terms than the same when cut in stone. Office of the Company 340 Broadway, New York.

### Fire Alarm Telegraph.

Dr. Augustus Eckert, of Middletown, Butler Co., Ohio, exhibits an ingenious electrical apparatus for the ringing of alarm bells in cities, in cases of fire. It is altogether the simplest invention for the purpose that we have seen. A common telegraph key is to be placed in each engine house and at as many other different points in the city as may be desirable. To sound an alarm it is only necessary to press the key. All the bells in the city, great or small, will strike once for every touch of the key. Only one battery is needed to operate the whole series of bells; near each bell, however, a clock-work apparatus is required. This invention is much more simple and easily managed than the alarm apparatuses now used in New York. Telegraph engineers will do well to give it a careful examination. Patented 1855.

### Measuring Instrument.

A pocket contrivance, intended to take the place of tape lines, measuring rules, &c., is exhibited by Mr. L. Young, No. 1 Whitehall street, N. Y. It consists of a small roller placed in gear with a disk marked off into a scale. In using it you run the roller along over the space to be measured, and find the result by looking at the pointer on the scale.

### Time-Keepers.

*Mr. John Sherry*, of Sag Harbor, N. Y., exhibits a working model of the great clock now in use on the tower of the City Hall, N. Y.—The elegant finish, and perfection of the works, and their steady movements, notwithstanding the continued jarring of the gallery floor where they stand, are worthy items of observation. Mr. Sherry has obtained a wide reputation for the excellence of his clocks; it is generally conceded, we believe, that corporations, when they apply to him for assistance, fall into good hands.

The time-piece on the City Hall is seen by more people, and regulates more of their watches and clocks than any other similar machine of the kind in the United States. During the three years that it has occupied its *high* position it has generally been found correct and reliable; it has really been a public benefit. Of Mr. Sherry's office clocks we can also speak from experience, for we have had one in our establishment for a number of years. Like its great prototype on the City Hall, its motions are unerring.

Several splendid specimens of thirty-day clocks are exhibited by the Atkin's Clock Co., of Bristol, Ct. They are made under Ives' patent. The spring is a flat one, like the half of an elliptic wagon spring. It is secured to the bottom of the clock case; this spring is not, in itself, a new invention, as applied to clocks: it is the equalizing arrangement, which insures perfect evenness of draught, that forms the important feature. The Atkin's clocks, if our information is correct, are superior time-keepers. Charles Root, Agent, No. 2 Courtland st., N.Y.

*Chronometers.*—Messrs. Eggert & Son, 239 Pearl street, N. Y., Morey Gray, 222 Water st., and Kline & Co., N. Y., exhibit fine assortments of American made chronometers.

*Calendar Clocks.*—Mr. Joseph S. Curtis, of Hartford, Ct., exhibits a large and beautiful calendar clock, which shows the hours and minutes, as well as the days of the week, month, &c. Patented last year.

*Mr. F. Kiddle's* traveling calendar clock is a splendid piece of workmanship. No. 3 John street, N. Y.

*Iron Frame Clocks*, ordinary construction, of very ornamental appearance externally, are exhibited by W. B. Lorton, No. 15 Dutch street, N. Y.

### Paper Box Cutting Machine.

Rectangular paper boxes such as the small neat kind used for containing jewelry, &c., are made out of white and ornamented card paper. The material is first cut into rectangular pieces, of such a size that, when a square piece is cut out of each corner and a *score* cut along the two sides and ends, they can be lapped up into the form of a box, only requiring a band pasted around them to hold them together. The lids are made in the same manner.

Mr. Andrew Dennison, of Brunswick, Maine, exhibits a machine for doing the above work, the first of its kind, we believe. It consists of a small frame, with a die, guard, and a sliding knife, in a spring gate. Each piece of paper for a box or lid, is held against a guard plate to allow the proper depth of side and corner to be scored and cut out. The knife handle is then moved to the one side, when a corner is cut out and one side scored. The paper is then shifted, and another corner is cut out and a side scored by another stroke, and so on successively; the four corners are thus cut out and the sides and ends scored ready to be lapped up and tied with a band, and formed into a box. These operations are performed with great rapidity; a boy of 12 years of age being able to cut out 60 gross of pieces per day—30 gross of complete boxes. This invention has been illustrated in the Scientific American.

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### TO CORRESPONDENTS.

J. S. G., of Va.—Zinc paint is put on like white lead. For inside work but little oil is used; it is mostly mixed with turpentine and white varnish; the latter is used to give it a glossy surface.

J. N., of N. C.—You wish to know how to connect a run of stones to your steam engine, which drives a saw, the motion of which is irregular, and too fast for grinding; and you propose cone pulleys with belts, to be shipped by the hand. Your engineer may be able to connect the governor of the engine with the shipper of the pulley belt, so as to render it self-acting, and thus a uniform motion may be given to the stones.

O. G., of Me.—The amount of water escaping into Winter's hydrostatic chamber, was stated to be that which passed between the bottom plate and the rim: the quantity given, you admit, is correct. There is a very great difference of opinion among millwrigbts about every kind of water wheel. You are right respecting the water freezing in the discharge pipe during winter in the Northern States, but we would rather not use the hydrostatic chamber at all than to have it open at the wheel, as you propose, thereby requiring a weighted lever to keep the wheel down.

W, A. E., of Wis.—We cannot furnish you with Mr. W.'s address.

H. H. C., of Pa.—Gates for intercepting railroad crossings during the passage of the trains have been often proposed. Your ideas are not new, but there may be some novelty in carrying them out. If you wish to have our opinion on this point, you have only to send us a sketch and proper description of your plan.

J. N. F., of Pa.—A washing machine having a cylinder armed on its inner surface with pins for handling the clothes is neither new nor patentable. We have seen washing machines constructed in the same manner.

T. S. R., of Geo.—For driving the bed of a cylinder power press, there would be about the same amount of friction in the use of an endless belt or spur gearing. An endless chain, unless very perfectly constructed, would not be as accurate as gearing; nor is it as durable, and if well constructed it would cost more. Cannot answer in regard to the sheet flyer.

Box 21, Wis.—Letters not signed by the writer cannot receive attention. This is an invariable rule.

S. O. V., of Ill.—We presume a dynamometer for testing the draft of plows can be procured at any agricultural warehouse in Chicago.

C. W. B., of N. Y.—The application of clock gearing for operating a churn, does not present any grounds for a patent. The same thing has been applied for, and rejected by the Commissioner of Patents. There is not the slightest chance for you to succeed with your case.

J. H. M., of Tenn.—The original Woodworth Patent was granted Dec. 5th, 1828. It has been extended at various time for a period of 14 years additional, therefore it will not expire until Dec. 4, 1856. See remarks about this case on another page, You will also notice the report of a trial which covers the exact points of your inquiries. You must do all you can to oppose its extension. It is an abominable scheme as was ever hatched in human brains.

A, B., of Me.—We do not think you stand any chance to procure a patent on your alleged improvement in paddle wheels. It is an old device to employ an eccentric for changing the position of the paddles, so as to lift them vertically from the water. See Vol. 5, Sci. Am., History of Propellers and Steam Navigation.

H. G., of Port au Prince—Your draft for $165 came safe and was duly paid. We will attend to procuring the articles you order. The balance remaining in our hands will, we think, meet the bill of Mr. H. for photographic articles.

R. E. of Ill.—The work of Clark recently published by Blackie & Son, of this city, treats upon the mechanical engineering of railroads. It enters very largely into the exposition of the locomotive. It costs bound $24. We think it will be useful for you.

H. H., of Va.—The Cornish Engine is single acting. We cannot tell you the exact difference in economy between the Cornish Engine and a double-acting condensing engine, well cased and carefully managed. The difference cannot be much.

E. S., of Ind.—If you are a "devout reader" of the Sci. Am., you will find on page 36, No. 5 of this Volume, the address of the publisher of Francis' work on turbines.

Z. C. C., of Ct.—If you will refer to Vol. 7, Sci. Am., you will find an engraving of an anvil that combines all the desirable qualities you speak of. Your ideas in regard to roofing with paper are neither new nor patentable; they have frequently been suggested to us by correpondents.

T. H. H., of N. C.—The sketch of your alleged improvement in water wheels has been examined. Buckets have been arranged at almost any imaginable angle. We can see no chance for a claim on yours.

P. T. C., of Mass.—There is on Exhibition at the American Institute Fair a machine for knitting stockings which operates on the same general principle as yours. It is a good machine, and does excellent work.

C. W. McC., of N. J.—We discover nothing new or patentable in your marble saw device.

W. W., of Pa.—We regard the preliminary examination of an invention, previous to the issue of a patent, of vital importance: and we do not see that you have adduced a single objection worthy of being seriously considered.—Previous to the establishment of the law of 1836, for the period of 50 years, less than one thousand patents were granted; twice that number have since been granted in a single year. Under the care of competent examiners, a patent when issued has a bona-fide character for novelty, and is more certain of being sustained by our courts. To grant a patent for anything and everything would be to destroy this confidence, and deter the real men of genius, who scorn to ask for patents on shadows and vagaries of no real utility.

E. A., of Wis.—If you would manufacture a machine for dressing the furs it would be much better than to take out the coarse hairs by means of a knife held in the hand. By stretching the skin upon a rotary cylinder capable of a reverse motion, and with two blades covered with india rubber, working across each other, it would dress the furs complete, and render them more even and saleable. Put your wits to work and get up a machine for the purpose.

R. T., of Mass.—The system of adulteration is practiced in this country to a great extent, but no legislative bodies make any attempt to expose it, as has been done by the English Parliament. Peas are used in this country to a great extent with coffee; and as for sperm oil, it is said upon good authority, that a pure article cannot be had.

A. C., Jr., of Texas—The description you give of a marble saw suggests no novelty. Several applications are now pending for eventually the same device.

E. F., of Ct.—The Mason testimonial is not abandoned, but, on the contrary, a liberal amount has been contributed. For certain reasons, a postponement in the time originally suggested for awarding the gift has been made, but the project is far from being abandoned. A number of contributions have been made since the last announcement of names were published, and subscriptions to the fund are still being received by the treasurer—Mr. Shugert. If your neighbor has but fifty cents for the object tell him to send it to us, and it will be faithfully applied. It is only small subscriptions from each that is wanted to swell the amount.

J. P., of Arkansas—Brass and copper wire are rendered elastic by drawing through a plate, Gold is rendered elastic by rolling and hammering.

D. S. K., of N. Y.—We have examined Mr. K.'s invention, and so far as the steam engine is concerned, find nothing patentable. The use of three cylinders with their pistons connecting with cranks, arranged as he describes, on the same shaft, is not new, having been applied both to marine engines and locomotives. Robert Stephenson, the English engineer, obtained a patent in England in 1846, for a three cylinder locomotive. In his engine the cylinders were arranged horizontally, two outside and one under the boiler, but the use of upright cylinders placed above the boiler is not new, as the first locomotives ever built were on that plan. The suspension of the boiler below the driving axle is not new. We believe that the principal obstacles which have presented themselves in experiments with locomotives for common roads, have been the ascent of inclined planes, and the concussions to which the machinery is subject in going over rough roads. The locomotive for common roads is now an almost forgotten invention. We have an English work which contains a great number of drawings and descriptions of them patented from 1802 to 1833, about which time, or shortly after, they appear to have been abandoned. If you can obtain Hebert's Cyclopedia of Mechanics in any library, you will find a good account of experiments. There appears to be something new in the pump.

A. T., of C. W.—We are not acquainted with the "Heeleanlight;" don't think we ever heard of it. Nothing specially new has come up lately in this department.

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Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, Oct. 27, 1855:—

J. O. M., of Mass., $30; A. & C., of O., $100; J. G., of N. Y., $25; P. A. of N. J., $30; C. & H., of Ind., $30; H. C. G., of Wis., $25; C. & P., of N. Y., $150; E. D. L., Jr., of Mass., $25; J. A. K., of N. Y., $175; W. B., of L. I., $10; G. H. C., of R. I., $150; O. B. J., of N. Y., $30; J. F. H., of Pa., $30; D. & K., of Pa., $30; E. B., of Cal., $60; G. L., of N. Y., $30; H. L., of N. C., $25; A. G., of N. Y., $30; T. C. H., of N. Y., $30; J. P. R., of N. Y., $30; A. M. G., of N. Y., $30; E. W., of N. C., $30; W. & K., of Iowa, $30; N. H. F., of N. Y., $25; J. T. J., of Ill., $5; G. W. S., of Pa., $20; F. V. D., of Mich., $30; R. U., of Mich., $20; J B., of Conn., $10; H. W. A., of N. Y., $55; S. E. T., of N. Y., $25; C. J. C., of Pa., $55; T. & H., of O., $25; W. & C., of N. Y., $55.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Oct. 27:—

J. B., of N. Y.; T. & H., of O.; J. P. H., of Va.; J. G., of N. Y.; H. L., of N. C.; C. D. W., of Wis.; H. C. G., of Wis.; E. D. L., Jr., of Mass.; J. B., of N. Y., (2 cases); J. T. J., of Ill.; H. R. B., of N. Y.; N. H. F., of N. Y.; W. H. F., of Ky.; J. S. S., of Mich.; G. W. S., of Pa.; S. E. T., of N. Y.; B. B. T., of N. Y.

### Important Items.

Models—We shall esteem it a great favor if inventor will always attach their names to such models as they send us. It will save us much trouble, and prevent the liability of their being mislaid.

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Subscribers or exchanges who are entitled, to the paper and fail to receive it regularly are desired to inform us that any omission may be corrected. Missing numbers are furnished gratuitously where the fault rests with the publishers.

Patent Claims—Persons desiring the claim of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 as fees for copying.

### Literary Notices.

We have received from T. B. Peterson, No. 102 Chesnut street, Philadelphia, three pamphlets, entitled "Calderon the Courtier," by Sir E. L. Bulwer; "The School boy," and the "Seven Poor Travelers," by Charles Dickens. Each story is sold for 12 1-2 cents. If any of our readers want to please their children they should get the Christmas Stories of Dickens.

The Bibliotheca Sacra—This repository of sacred literature, for the present month, contains some very fine articles. The leader is one on the "Philosophy of Grammar," by Prof. Porter, of Yale College. It is long and profound, and should be read with much care by all students. The "Notes on Palestine," by Rev. W. H. M. Thomson, are very interesting. This review of Biblical literature is published quarterly by W. F. Draper, Andover, Mass. It is edited with great ability, and has a world-wide reputation.

Old Blackwood—The October number of this excellent magazine has been promptly republished by its American publishers, Leonard Scott & Co., No, 54 Gold st. It contains "Zadee," a romance, continued, and Part 10 of the "Story of the Campaign," written by an officer in the Crimea, and is a faithful account of all the doings there. Blackwood is now forty years of age, but in point of pith and power it stands unrivalled.

The National Magazine—Published by Carlton & Phillips, 200 Mulberry street, N. Y. This valuable and very entertaining work is full of good things this month. "The Captivity and its Mementos," also "A Meditation on Tobacco," are very excellent articles. The illustrations in this number are fair. Terms $2 per annum.

Leslie's New York Journal—The November number of this illustrated monthly magazine contains a great number of excellent engravings of scenes in the Crimea. It also contains a great variety of literary matter, such as stories, history, anecdotes, &c., all illustrated with wood cuts. Frank Leslie, publisher, No. 14 Spruce st., New York.


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In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the Scientific American. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence.

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# Science and Art.

### Correcting the Mariner's Compass.

It is a well known fact that the local or induced polar attraction in iron vessels has been the cause of vitiating the terrestrial magnetic action of the compass, and thereby has led to the loss of a number of ships, on accounnt of steering in the wrong course. To overcome local attraction on board of iron ships has long occupied the attention of eminent scientific men in all parts of the scientific world; and there has been a standing committee in the city of Liverpool, appointed by the British Scientific Association, called the "Compass Committee," whose object has been to collect information on the subject, and to discover a remedy for the evil, if possible. Hitherto, their efforts have been unsuccessful to discover an effectual and universal remedy. Various remedial plans have been tried and are now in use, but all, it is stated, are more or less defective. We perceive by a paragraph in the Boston *Atlas*, that Capt. Morris, of the iron steamer R. B. Forbes, has discovered a true universal remedy, that may be relied upon under all circumstances for correcting the compass. A description of the discovery is not given; the statement, therefore, must be received with caution. If true, the invention is one of great moment to the nautical interests of every nation, as iron ships are becoming more numerous every year. It is stated that Capt. Morris has used the plan himself, with perfect success, for six years, and that his compasses have not varied one-eighth of a point during all that time.

### Improvement in Cotton Gins.

The accompanying figures represent the improvement in Cotton Gins for which a patent was granted to H. H. Fultz, of Lexington, Holmes Co., Mississippi, on the 9th of last month (October.)

The nature of the improvement consists in giving the cotton to be ginned a spiral motion in the feed box, over the saws, so that it (the cotton) is made to pass from one end of the feed box to the other, to present a fresh surface of it to the action of the saws as it passes along; also to prevent the staples from being cut by the saws; while at the same time the cotton is cleaned in a superior manner.

Fig. 1 is a front view of the improved gin, with the seed board removed, and fig. 2 is a transverse vertical section of it. The same letters refer to like parts.

A represents the shaft on which the saws, B, are secured. The saws rotate between the ribs, *a*, of the breast, C. D is the seed board, secured between side pieces, *a' a'*, of the frame, E, to which the breast, C, is attached (these parts are of the usual construction.) The frame, E, of the breast is secured by hinges, *b b*, to the frame, F, of the gin, so that the breast may be raised or lowered, to allow the saws to project the requisite distance between the ribs, *a a*. To the upper part of the frame, and between the ribs, *a*, of the breast, the lower ends of oblique plates, *c*, are fitted. These are of a curved form, as represented in fig. 2; their back edges are made to correspond in form to the upper curved cross piece of the frame.—The upper ends of these oblique plates, *c*, are fitted in a bar, G, the ends of which are of a cylindrical form, and pass through the side pieces, *a' a'*. This bar, G, has a regulating screw, *d d*, on each end, by which any degree of obliquity can be given to the plates, *c*.

The feed box is formed by the seed board, D, side pieces, *a' a'*, and breast, C. The cotton to be ginned is placed in at one end of this box—at H, fig. 1. By the action of the saws, B, the cotton is turned within the feed box and the oblique plates, *c*, move it from the end, H, towards the opposite end, as indicated by the arrows. By this means, a fresh surface of cotton is presented to the action of the saws, as it is moved spirally along the whole length of the feed box, and the cleaning and separating of it must be accomplished in a superior manner to that of the common gin.

It will be observed, that by giving the cotton a spiral feed motion to the saw, the staple will not be cut by them, as in common gins, by long direct action upon one part. The long staple is therefore separated near the feed end, H, and is subjected to the action of the saws for only a short period; the medium staple is taken out about the middle of the gin, and the short staple at the extreme end opposite H.—At this end of the box the saws are placed closer together, and the seed is stripped off the short fiber, as shown in fig. 1. The seed and hulls also pass out underneath the seed board at the end of the box, a suitable opening being made in it for this purpose.

In the common cotton gin, the staple is liable to be cut by the saws, because the cotton as placed in the feed box, merely rotates by the action of the saws, consequently, in order to separate the seeds perfectly, it is subjected for a long time to the direct action of the saws, which thereby cuts the longer staples, discharging all of about an equal length. In this machine the cotton is separated into three qualities—long, medium, and short staple and each quality receives an action commensurate to clean it—the longer staples are not acted upon more than may be required, while the shorter staple is acted upon as long as is necessary.

## FULTZ'S PATENT COTTON GIN.

Fig. 1.

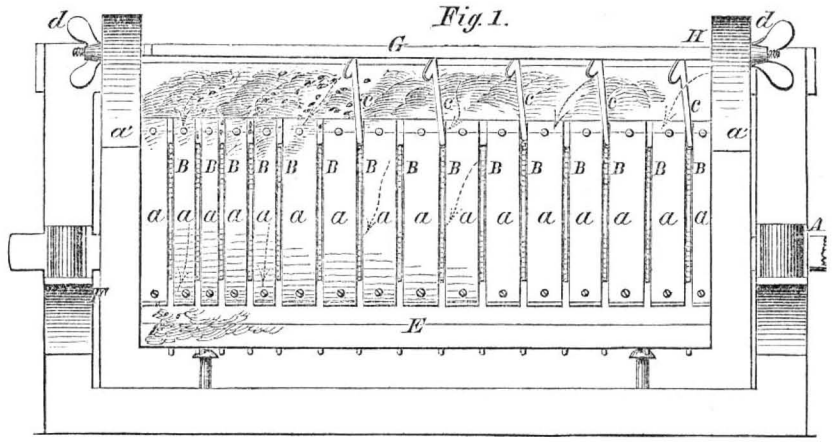
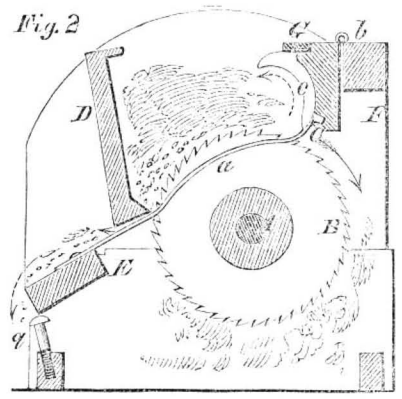



Fig. 2




By experiments made with this gin, three important results, as we have been informed, have been obtained. "First, an increased quantity of cotton ginned by it; second, an improvement in the quality of the cotton over that ginned by the old method—its value being increased from one to two cents per pound, as decided by the cotton brokers of New Orleans; thirdly, all the hulls are discharged with the seed, without being cut with the saws."

Every improvement in cotton gins is of great consequence to our country, and this one appears to be valuable and important.

More information respecting it may be obtained by letter addressed to Mr. Fultz, at Lexington, Miss.

## HANGING RECIPROCATING SAWS.

Fig. 1

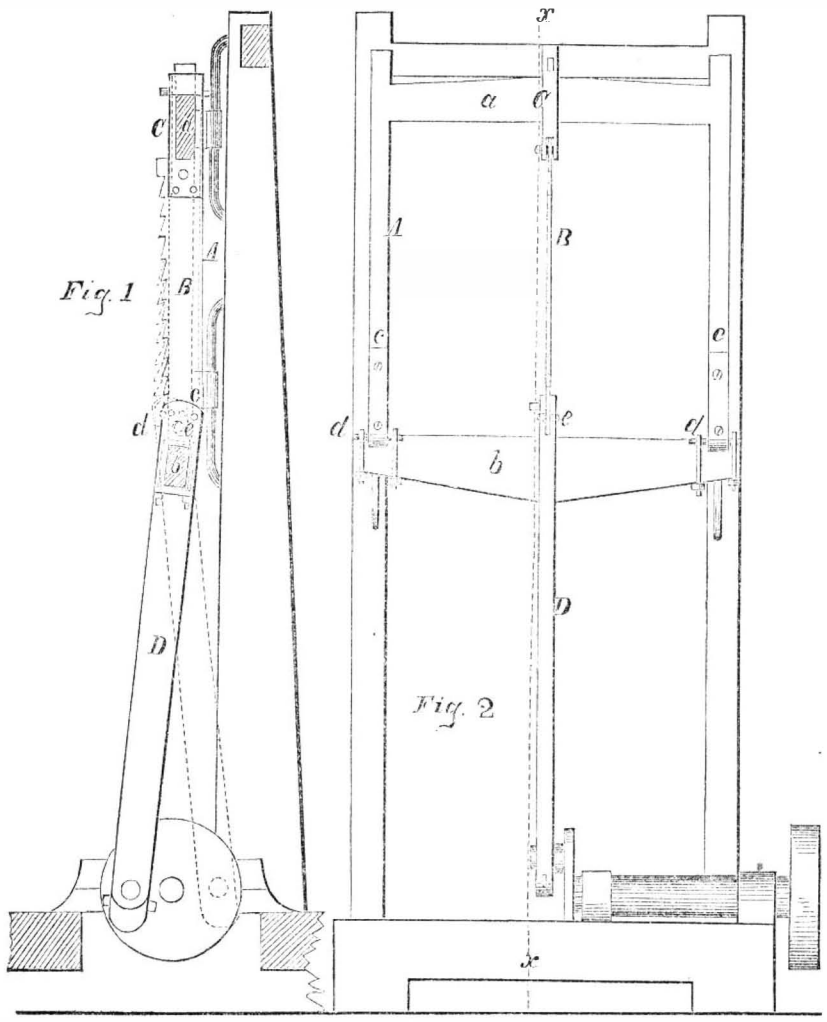



Fig. 2




The annexed engravings, represent the improved mode of hanging Reciprocating Saws, for which a patent was granted to O. S. Woodcock, of Connersville, Ind., on the 11th of Sept. last. The nature of the improvement consists in attaching the lower end of the saw directly to the upper end of the pitman—the tug-pin of the saw forming a joint, and the pitman working on a suitable fulcrum below the tug pin. Fig. 1 is a transverse section taken at *x x*, fig. 2, which is a front view of a saw sash and pitman, showing the improvement. Similar letters on the figures refer to like parts.

A represents the saw sash, and B the saw, the upper end of which is attached by a stirrup, C, to the upper rail, *a*, of the sash, in the usual manner. The lower rail, *b*, of the sash is connected permanently to the pitman, D, a short distance below its upper end, and the ends of the rail, *b*, are connected to the lower ends of the stiles, *c c*, of the sash, by joints, *d d*. The lower part of the saw, B, is attached by a pin, *e*, to the upper end of the pitman, and as the pitman extends a short distance above the rail, the pin, *e*, will be a short distance above the joints, *d d*, which connect the lower rail, *b*, of the sash with the stiles, *c c*, consequently as the sash, A, is moved up and down by the pitman, the saw will be thrown in and out from its work. When the sash descends, the pitman will throw the lower end of the saw towards the log, and when the sash ascends the lower end of the saw will be thrown from the log, because the joints, *d d*, serve as fulcra for the pitman, and the saw is attached to the pitman above the joints, *d d*.

By this improvement, the sawdust has ample room for escape during the upward movement of the saw, and the saw is prevented from being choked or clogged, and will run lighter and freer, and will bear more feed, and consequently work more rapidly than saws hung in the usual way.

This saw has a dipping motion given to it like that by hand sawers; this is accomplished in an exceedingly ingenious and simple manner by the mode in which the joint of the connecting rod and the hinged fulcra saw sash are arranged, as will be readily understood by examining the figures attentively.

This improvement may be applied to saws which are not hung in sashes, and technically termed "mulley" or "moilly" saws, equally as well as to those which are placed in sashes. All that is required is to have a fulcrum for the pitman equivalent to the joints, *d*.

More information may be obtained by letter, addressed to H. B. & O. S. Woodcock, Connersville, Ind.

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